ENGINEERING NEWS-RECORD

JUNE 26, 1958

PRICE 35 CENTS

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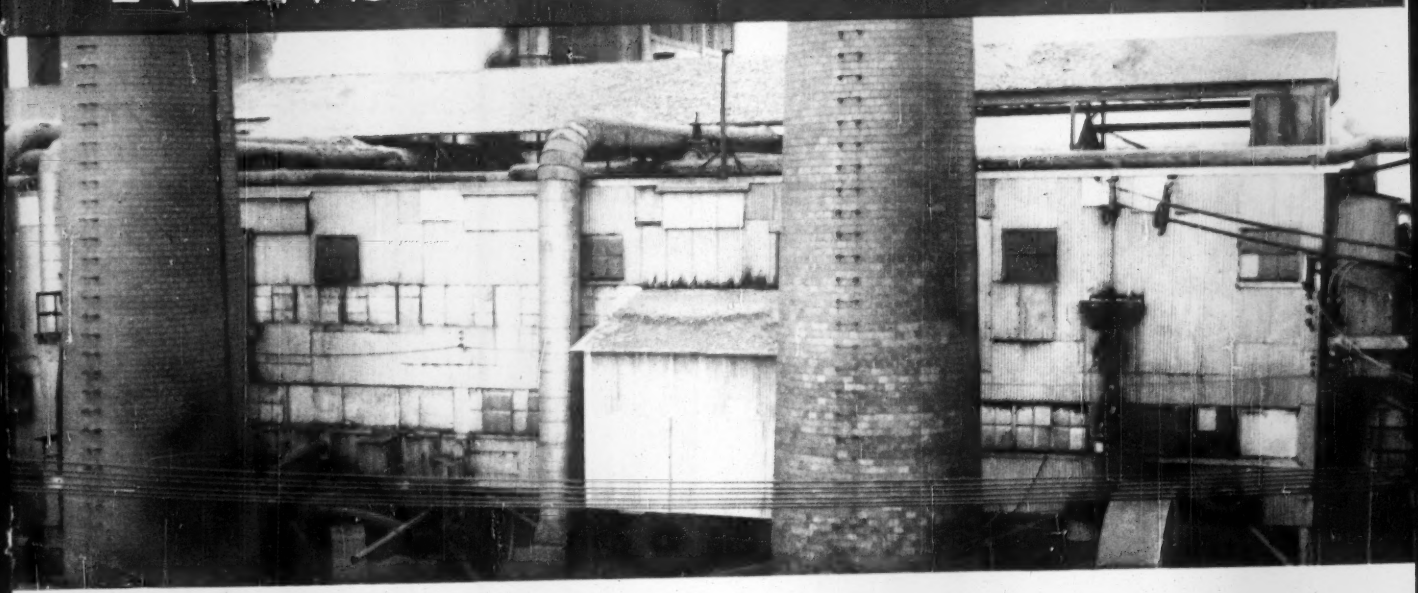
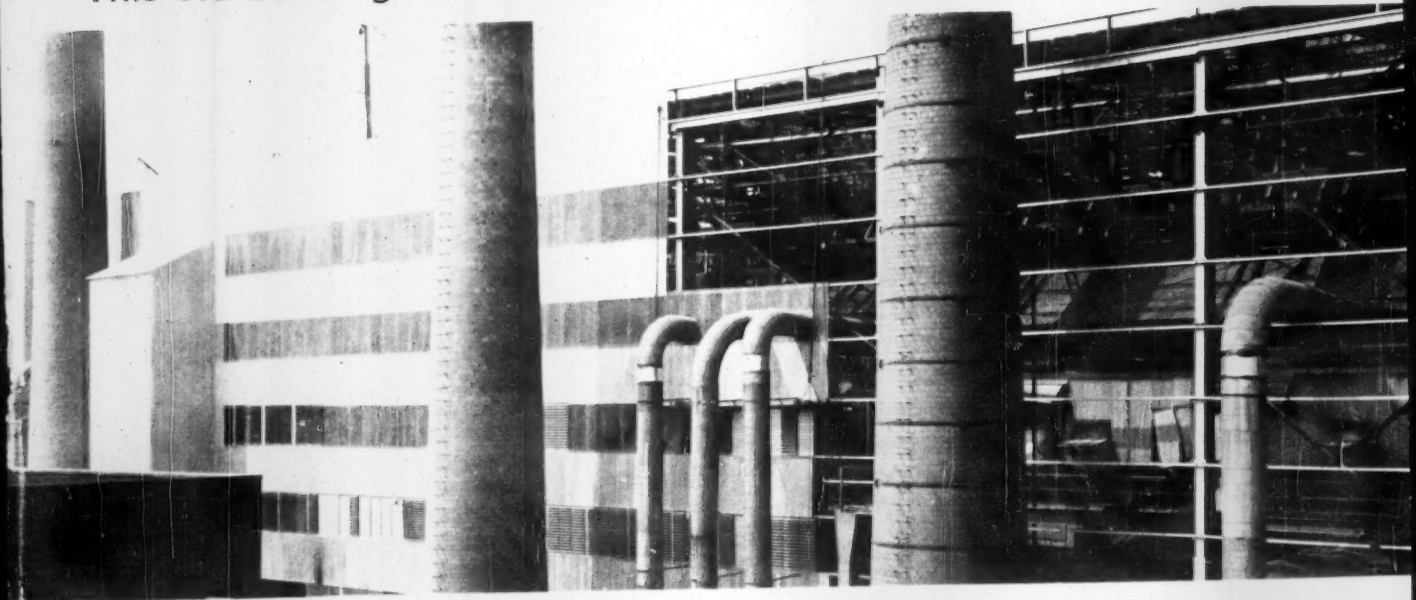


This old building housed a good plant . . .



. . . So they built a new structure around it p 38

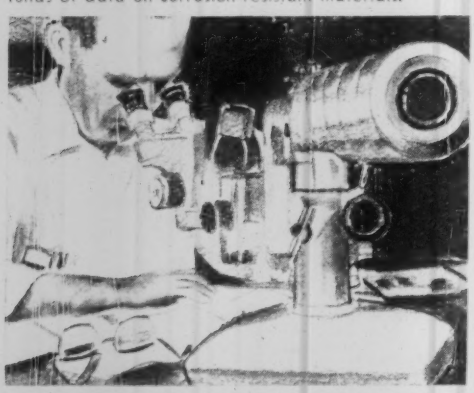
A McGRAW-HILL PUBLICATION

E B POWER GS N
UNIVERSITY MICROFILMS IN
313 N 1 ST
ANN ARBOR MICH

A Byers field service representative can relate new 4-D Wrought Iron test results to the specifier's corrosive applications.

Laboratory and field test results lend added support to 4-D Wrought Iron specs

Our metallurgical staff compiles and analyzes great funds of data on corrosion-resistant materials.



With some products, a company representative's natural enthusiasm is often *tempered* by actual test results in the laboratory.

Not so however, with new 4-D Wrought Iron. Byers field service engineers can present research facts which confirm the increased corrosion-resistance of this new product.

Comparative testing with standard Wrought Iron, as well as many ferrous substitutes, proves new 4-D Wrought Iron a decidedly superior deterrent to corrosion. So the wisdom of standard Wrought Iron specifications may now be further enhanced by specifying new 4-D Wrought Iron.

Byers field service engineers are lending even more credibility to this story with their own knowledge of corrosive infighting. The Byers representative will welcome an opportunity to relate these test results to your corrosive applications. Call him soon. Or, write us for helpful literature on new 4-D Wrought Iron. A. M. Byers Company, Clark Building, Pittsburgh 22, Pa.

BYERS WROUGHT IRON

GOODYEAR INDUSTRIAL PRODUCTS
G.T.M.-Specified
Contractor's Air-Water Hose
for Construction Work
A
B
C
CONTRACTOR'S AIR-WATER
A Rugged cover that's both abrasion- and sun-resisting—continuously print-branded for easy identification
B Extra-tough braids of high-tensile rayon cord to handle pressures, resist crushing or kinking
C Special nonporous tube resists alkali or slightly acid water

How to keep things flowing on any construction job

Keeping things flowing is no little trick—if you don't have completely dependable hose for every need.

Reason enough, then, that you should look into the Goodyear built-for-the-job line. Contractor's Air-Water Hose, for example, will suit many of your everyday requirements—handling air or water interchangeably—up to 200 psi.

And for more specialized jobs, there are specialized hoses recommended by the G.T.M.—Goodyear Technical Man: FLEXSTEEL for heavy-duty drilling or grouting. Large-bore STYLE 3752 Water Suction and Discharge Hose. HY-PRESSURE SAFETY Welding Hose. Style M-150 Steam Hose. Style M Concrete Discharge Hose.

No matter which you choose, you can depend on one thing: You're getting a Goodyear super-quality hose that will give you super-quality performance – *at lower cost and with a lower inventory than ever before.* Check the complete line with your Goodyear Distributor—or write Goodyear, Industrial Products Division, Akron 16, Ohio.

IT'S SMART TO DO BUSINESS *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*

Flexsteel, Hy-Pressure –T.M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

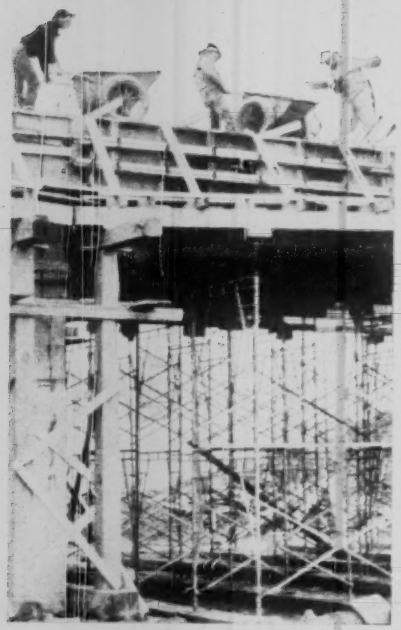
HOSE FOR ALL INDUSTRY by

GOODYEAR

60 GOODYEAR ANNIVERSARY

THE GREATEST NAME IN RUBBER

Bridge Forming



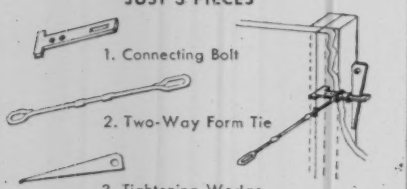
Symons Forms Cut 100 Days Off Bridge Forming Job

Ease of Erecting and Stripping Reduces Pouring Time

Contractor Lee Hoffman, Beaverton, Oregon, was given 320 days to pour 4,000 cubic yards of concrete for a bridge over Myrtle Creek in Oregon. Job was complete in 220 days or only ⅔ the time allotted.

Harry Pajutte, Chief Engineer for Hoffman, credits the ease of erecting and stripping Symons Standard High Strength Forms with contributing substantially to cutting pouring time, reducing number of men required on job, and providing greater mobility for the pouring equipment. Only

JUST 3 PIECES



3,144 square feet of panels were required for the 160,000 square feet of forming.

Symons Forms, Shores and Column Clamps can be rented with purchase option. Facts on Symons products and engineering service available upon request.

Symons

SYMONS CLAMP & MFG. CO.

4265 Diversey Avenue, Dept. F-8

Chicago 39, Illinois

ENGINEERING NEWS-RECORD

EIGHTY-FOURTH YEAR OF PUBLICATION

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ENGINEERING NEWS-RECORD, Vol. 160, No. 26, June 26, 1958

Published weekly by McGraw-Hill Publishing Company, James H. McGraw (1860-1948), Founder. Publication Office, 99-129 North Broadway, Albany 1, N. Y. See panel below for directions regarding subscriptions or change in address. **Executive, Editorial, Advertising and Circulation Offices, McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y.** Donald C. McGraw, President; Joseph A. Gerardi, Executive Vice President; L. Keith Goodrich, Vice President and Treasurer; John J. Cooke, Secretary; Nelson Bond, Executive Vice President, Publications Division; Ralph B. Smith, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising Sales; A. R. Venezian, Vice President and Circulation Coordinator. **Subscriptions are solicited only from persons with identifiable commercial or professional interests in construction and building. Position and company connection must be indicated on subscription orders.** United States subscription rate for individuals in the field of this publication $6.00 per year, single copies 50 cents; foreign $20.00 per year, payable in advance. Second-Class mail privileges authorized at Albany, New York. Printed in U.S.A. Title registered in U.S. Patent Office.

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Add to this that Northwest quality of "always being ready to go." *We hear it everywhere and Northwest users will tell you so.* It's the big reason why Northwests are money makers.

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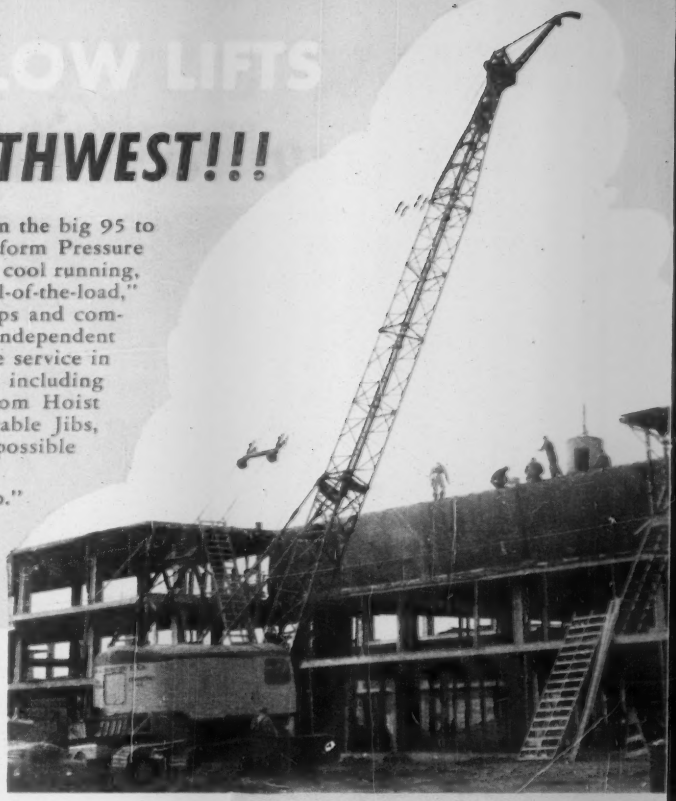
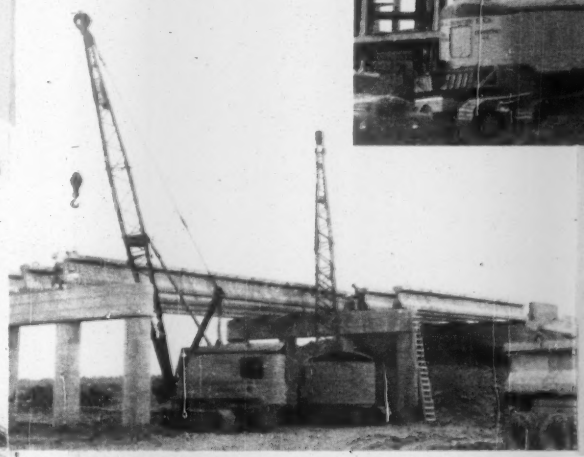
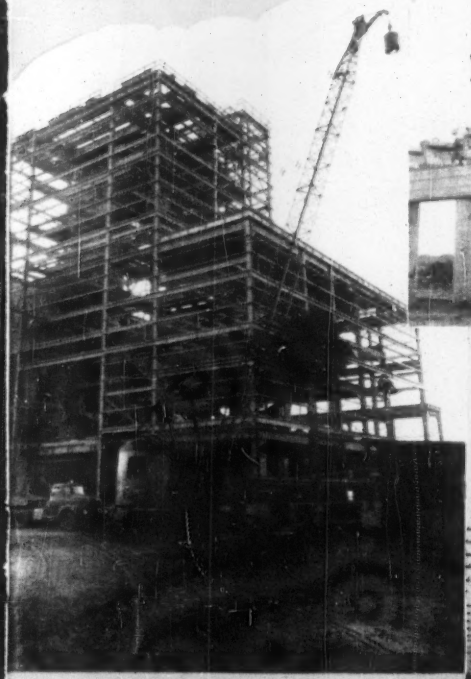


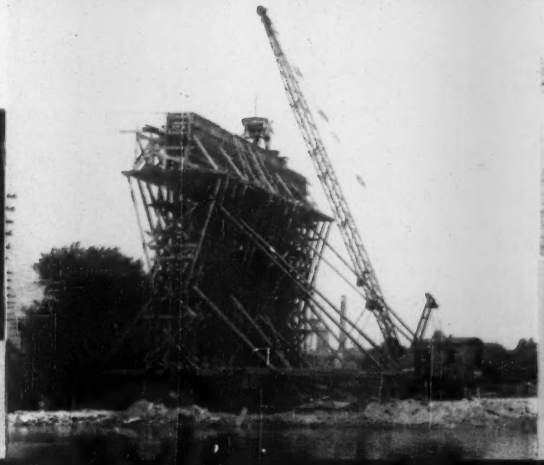
A big Northwest 80-D makes an easy job of pouring. Plenty of boom and the jib make placing easy over a wide area of floor.

Right: Two Northwests coordinate smoothly to place a heavy precast concrete beam.





Above: High floors are no problem with a Northwest.



Above: Pulling sheeting, jetting or driving piles or sheeting is all in the day's work for a Northwest.

Left: A Northwest Model 41 pours smoothly to forms for a bridge pier.

NORTHWEST *Always Ready to* GO

NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

SHOVELS	CRANES	DRAGLINES	PULLSHOVELS	TRUCK CRANES
¾ Yd. to 2½ Yd. Capacity	13-Ton to 50-Ton Capacity	¾ Yd. to 3 Yd. Capacity	¾ Yd. to 2½ Yd. Capacity	25-Ton and 35-Ton Capacity

Move up to King-size profits

K370 1¾-yard shovel-crane delivers 16% or more output than 1½-yard rigs

There's good reason volume producers move up from 1½ yeard shovels and draglines to Link-Belt Speeder 1¾ yard machines and write new production records. Here's why:

1. 16% more bucket capacity offsets the slight added cost of "buying up" to the 1¾ yard K-370.

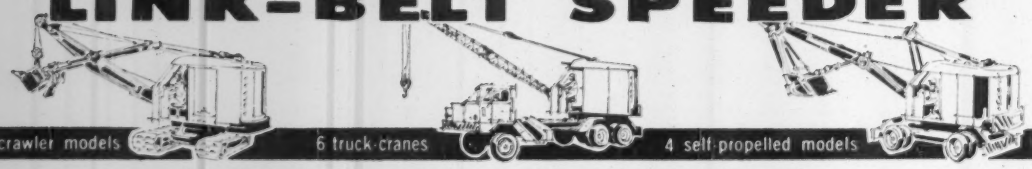
2. Fast—maneuverable as many smaller machines because of Speed-o-Matic power hydraulic controls and hydraulic power steer.

3. Produces as much as many 2-yard rigs because of the power hydraulic controls and bonus usable horsepower.

Move up to a 1¾ yard K-370 . . . cut your per yard cost . . . improve your competitive position . . . put yourself in line for King-size profits.

For details on the K-370 and its 3-yard mate (K-608) see your distributor or write Link-Belt Speeder Corporation, Cedar Rapids, Iowa. 14.898

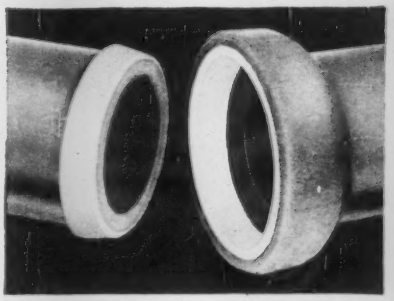
LINK-BELT SPEEDER



It's time to compare . . . with a Link-Belt Speeder

lower installation costs FIVE WAYS with longer, stronger AMVIT Clay Pipe

Outstanding Mechanical Joint of Plasticized Resins of Polyvinyl-Chloride Gives Lower Cost-In-Place



A million dollar expansion program to increase production facilities for Amvit was completed earlier this year. New horizontal extrusion machines now manufacture pipe in over four feet lengths.

Longer lengths lower installation costs, reduce the number of joints, lessen the number of pipe sections to be handled. *Here's how you can save on installation with Amvit:*

1 SAVES LABOR

No other materials such as caulking, joint compounds, hot pots or ladles are needed to make the Amvit Joint. The joint is on the pipe delivered to the job ready for use. Nothing else is needed. Just push the pipe together and the joint is complete.

2 IMMEDIATE BACKFILLING

As soon as the joint is made, backfilling can start. No need to wait for unnecessary delays caused by bad trench conditions, high-water table, unstable ground or running sand. Barricades can be removed and streets opened days sooner.

3 QUICK TESTING

No need to wait days to see if a line has passed test. A look at the completed joint will tell. Thus, engineers can inspect and accept the line allowing the contractor to receive payment quicker.

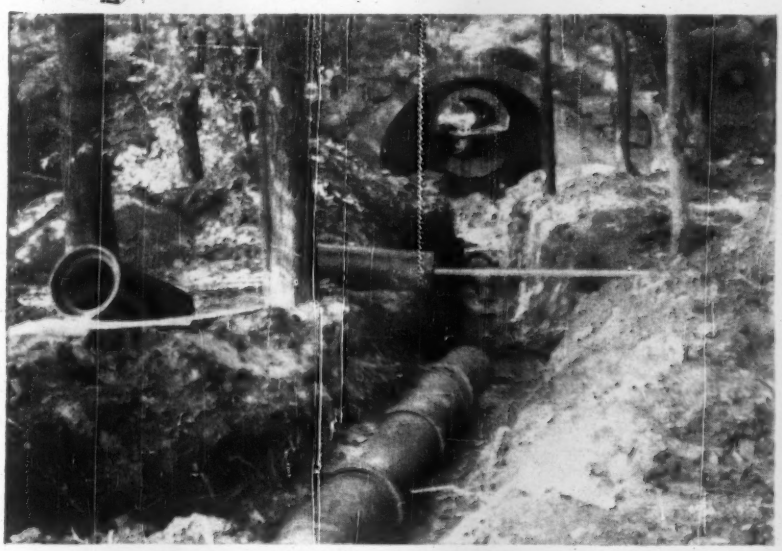
4 PERMITS DEFLECTION, ABSORBS SHOCKS

Amvit is made from a plastic which has many characteristics similar to rubber. It is pliable, permitting deflection without leakage. It is resilient, can absorb shock and vibration. This allows for settlement of pipe in poor ground conditions after backfilling.

5 COMPLETE FITTINGS

Amvit is furnished on all standard fittings, as well as pipe. This will permit a uniformly tight line from house wall to treatment plant.

For more information on how Amvit can help cut your sewer project costs, write or call American Vitrified Products Company, National City Bank Building, Cleveland, Ohio, or our office nearest you.



Amvit line being installed in Amherst, Ohio

SINCE 1900

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CLEVELAND, OHIO

MANUFACTURERS OF: Clay Pipe, Flue Liners, Clay Liner Plates and Concrete Pipe.

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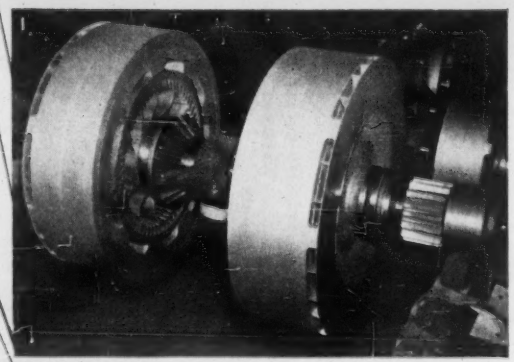
P&H announces world's greatest truck crane 70 tons at 15 ft. radius

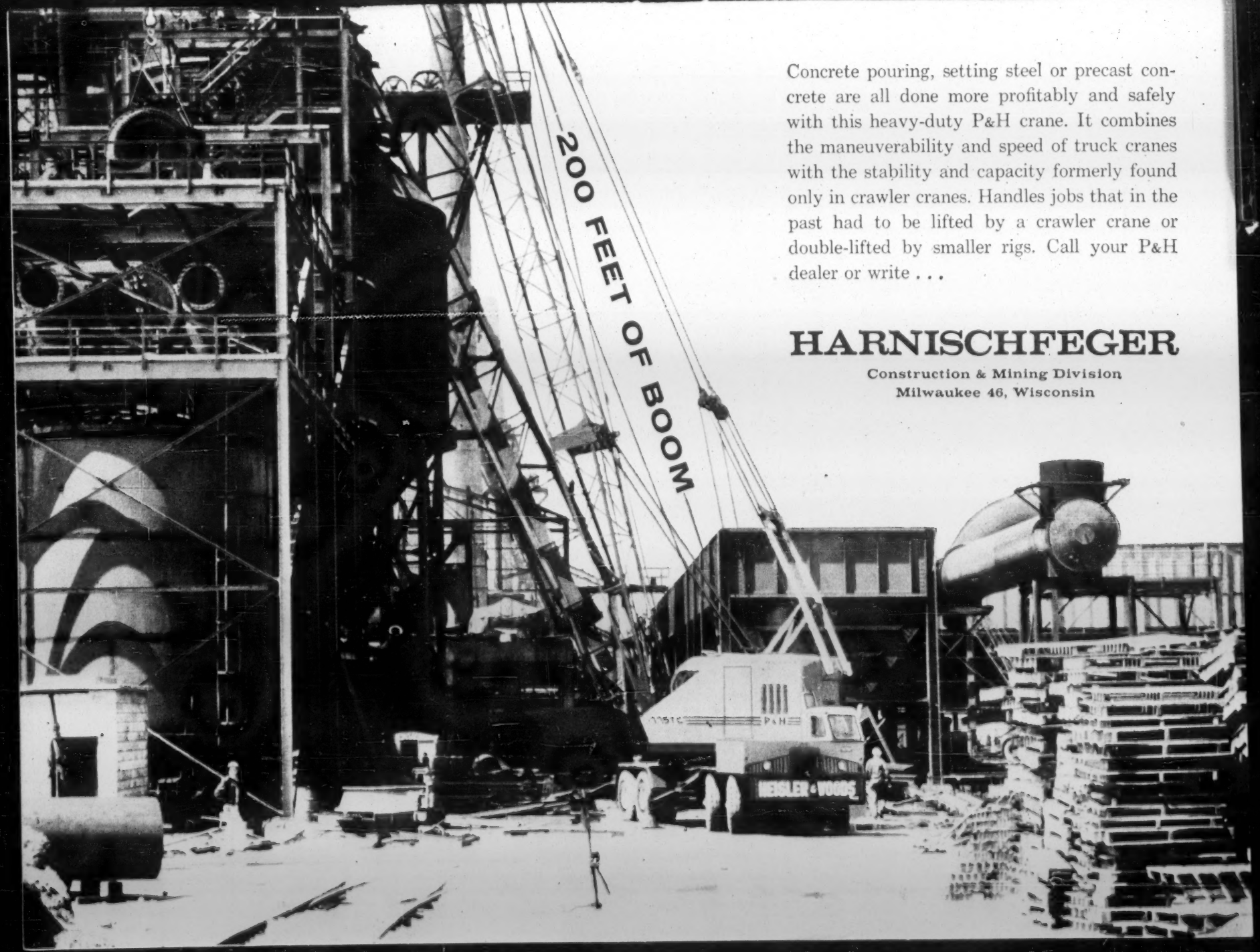


MAGNETORQUE, the electro-magnetic swing assembly, eliminates swing linings and friction on your swingers — no wear, no adjustments — faster work cycles, less operator fatigue, increased production.

Here's another example of P&H design leadership in meeting contractors' needs for larger capacity equipment to hold down costs and do more work at a greater profit.

It's the big P&H 775-TC. An innovation on rubber. Handles 200 ft. of boom and jib. Smooth "stepless" swing movement of the boom with capacity load is the result of an electro-magnetic swing assembly. It's called Magnetorque®, exclusive P&H development appearing for the first time on a truck crane.

A full 70-Ton capacity at a practical 15' radius. This tremendous lift and reach are combined with exceptional truck crane mobility in the 775-TC. Superior P&H engineering has scientifically distributed the weight over *four* axles to allow highway travel.



Concrete pouring, setting steel or precast concrete are all done more profitably and safely with this heavy-duty P&H crane. It combines the maneuverability and speed of truck cranes with the stability and capacity formerly found only in crawler cranes. Handles jobs that in the past had to be lifted by a crawler crane or double-lifted by smaller rigs. Call your P&H dealer or write . . .

HARNISCHFEGER

Construction & Mining Division
Milwaukee 46, Wisconsin

Another Winning Combination

...Famous GALION ROLL-O-MATIC* TORQUE CONVERTER Rollers

Galion "Chief" 3-Wheel Roller with Continental Gasoline or Cushioned Power* Diesel Engine.

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They're paying their way, with plenty to spare, on road jobs the country over, these rugged Galion rollers with Continental Red Seal—Diesel or gasoline. Galion Roll-O-Matic Torque Converter Drive not only cuts fuel consumption as much as 25 per cent, but greatly lengthens life of engine and power-transmitting parts. Whether the going is uphill, downhill, or on the level, oil in motion *automatically* matches the driving force to the need. User satisfaction with Galions underscores the familiar statement:

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Continental Motors Corporation

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Reader Comment

No Missile Base Monopoly

Sir—ENR May 15, p. 8 printed a letter from John Gantry, consulting mechanical engineer, Cleveland. He asserts that the architect-engineer design work for Air Force missile bases has become a monopoly of a few firms.

To refute this charge, it should be known that there are presently 16 district engineering firms engaged in various phases of base design for the ICBM program. These firms have offices in a number of cities in the United States and are not confined to California alone. During the early stages of development of criteria for ICBM base requirements, the design was largely performed by the firm of Holmes & Narver of Los Angeles.

As the program expands and additional missile bases are to be constructed in various parts of the United States, the Air Force will solicit architect-engineer proposals from recognized architect-engineer firms on a nationwide basis. It is clearly Air Force policy to make wide utilization of the professional talents of architect-engineer firms throughout the country.

JOHN M. FERRY
Special Assistant for Installations
Department of the Air Force
Washington, D. C.

Draftsmanship

Sir—I read with considerable interest John W. Titus' article entitled "In Defense of Drafting" (ENR May 15, p. 64) and heartily agree with the sentiments expressed therein. Without wishing to detract from the value of the recent technical graduate, the writer feels that in the last few years, due to a temporary scarcity of engineers, the graduate's value has been somewhat overemphasized.

Some years ago a young graduate felt that he would have to work at the drawing board for a number of years before he was given an opportunity to design. The present graduate, however, feels that he should immediately be given an opportunity to design important structures, and that work at the drafting

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

DRY EXCAVATION

AT THE OCEAN'S DOORSTEP THROUGH STANG DEWATERING

H. C. Smith, contractor, says:

"STANG's expert engineering, instantaneous service and know-how KEPT OUR JOB DRY."

"We've used Stang on many jobs, and the thing that always impresses us most is the speed of service. Saturdays, weekends, day or night, when we call them, they're here. Besides the service, we depend on their engineering. Because they're experts in handling water, they invariably save us time and money.

On this particular job, we encountered several unusual and difficult water handling problems but, thanks to Stang's engineering and know-how, we kept out of any real trouble. In our book, Stang is tops."

For the most practical and economical answer to **your** water handling problems, call on water handling specialists . . . call STANG!

PICTURED ABOVE: The Scattergood Steam Plant, in Southern California, on the edge of the Pacific Ocean. The excavation, made in beach sand, measured approximately 300' x 100' at sub-grade, with a maximum cut in the deep section of 32' below the water table.

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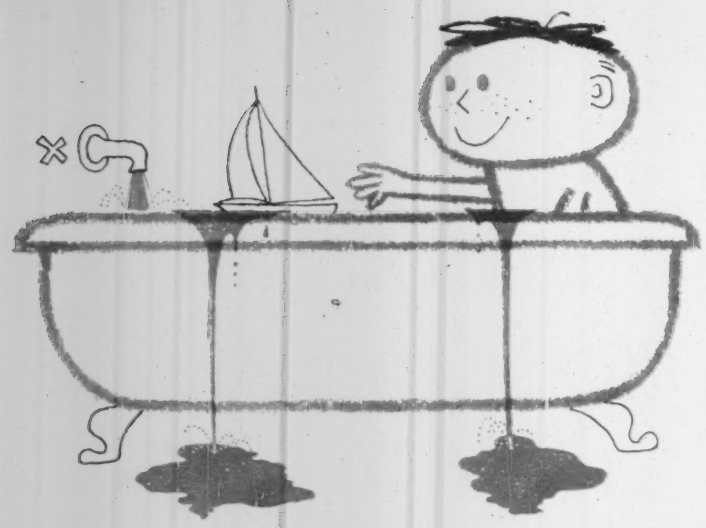


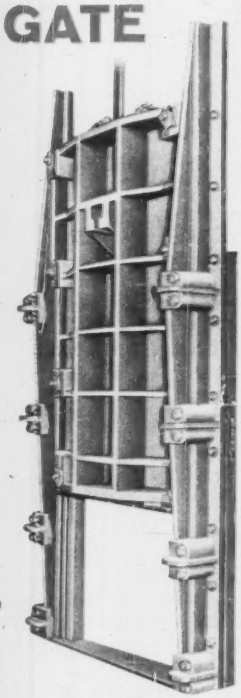
For maximum flow...

Rodney Hunt HY-Q Flush Bottom Closure Sluice Gates provide exclusive operating and control advantages by eliminating turbulence and impedence at the invert. Unlike any other design, the Rodney Hunt HY-Q gate seats on a sill flush with the invert. It imposes no impedence of a raised sill. There is no pocket for bottom wedges to create turbulence. Where hydraulic gradient is greatest ...at the bottom of the gate... the HY-Q gate presents a smooth unbroken surface for full, fast, non-turbulent flow.

HY-Q® SLUICE GATE

The first basic sluice gate improvement in years features a resilient seal fastened to the bottom of the sliding disc to provide a cushioned closing at the stop bar. This flush bottom closure results in the construction economies of smaller gate sizes, narrower channels and lower channel walls for a given volume of flow. It provides unmatched design flexibility for water, sewage treatment and similar projects... with more than 80 gate sizes available, ranging from 12" x 12" to 190" x 120".

For full design and specification data, write for your copy of Catalog 75.



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board is beneath him. Many also feel that, now that they have graduated, their days of study are over, and some sell their text books at the second-hand book store after graduation, instead of keeping them as a nucleus for their technical library. They do not realize that while their professors have done a fine job in grounding them in the essentials, the professors manifestly cannot teach them all they should know, and that a man who wishes to get to and stay at the top in his profession will probably have to spend a lifetime of reading and study to keep up with the progress in his chosen field.

A man highly educated in the analysis of indeterminate structures might still not be qualified as a designer because he knows nothing of drawing room and shop practice and limitations, and the problems that arise in shipping and erecting a structure.

If he is clever and alert, our graduate will learn and acquire many of the other important qualities mentioned by Mr. Titus.

KARL W. LEMCKE
Hardesty & Hanover
New York, N. Y.

Quick Drainage Estimates

Sir—The Kent County Road Commission (Grand Rapids, Mich.) for the last 28 years has had a complete set of run-off curves similar to those mentioned in your article, "Quick Drainage Estimates" (ENR May 8, p. 73). These curves are computed for both sand and clay soils with five curves for varying degrees of land slope for each type of soil. Separate curves for each type of soil are provided for 0-100 acres, 100-600 acres and 0-50 square miles.

These curves were prepared by William Bronson, presently bridge engineer for the Commission.

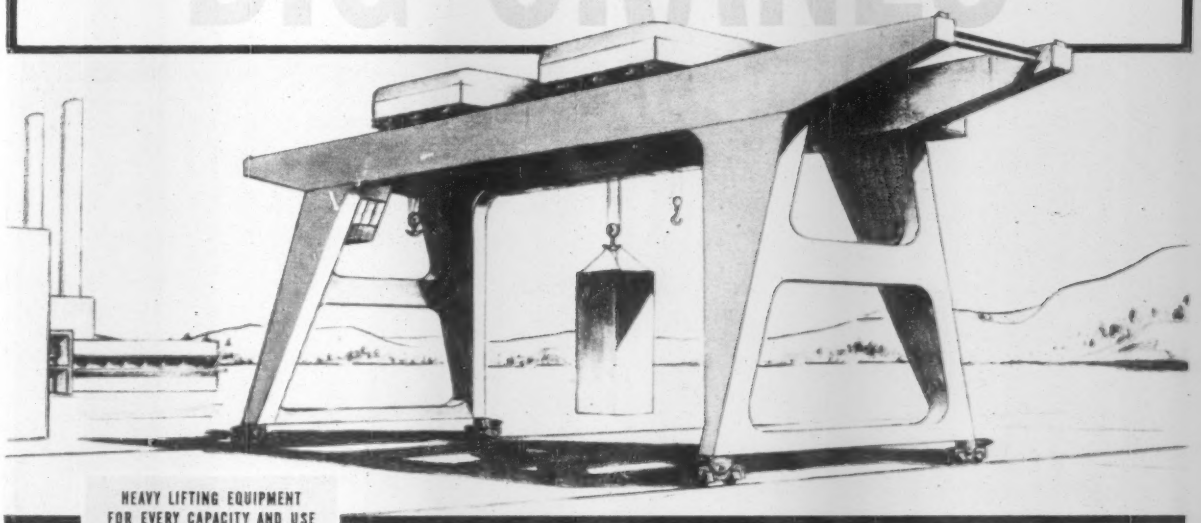
EVERETT S. THOMPSON
Grand Rapids, Mich.

Engineers in Government

Sir—It is amusing to read the alibis and excuses put forth by Col. Lynn Pine of the Corps of Engineers—placing blame on job descriptions, as it were, in his letter (ENR May 1, p. 6) commenting on Mr. Johnson's article on engineers in federal employ (ENR Mar. 6, p. 42).

As a former Army man in the Corps of Engineers, with considerable time spent in a high civilian engineering supervisory category, I cannot accept his theories. In my opinion, job descriptions meant little or nothing, particularly where I have witnessed former lower grade officers writing up such

BIG CRANES



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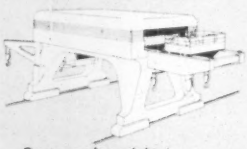
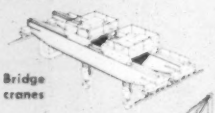
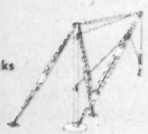


Gantry and special purpose cranes

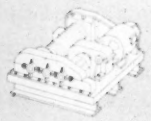


Bridge cranes

Whirley cranes



Derricks



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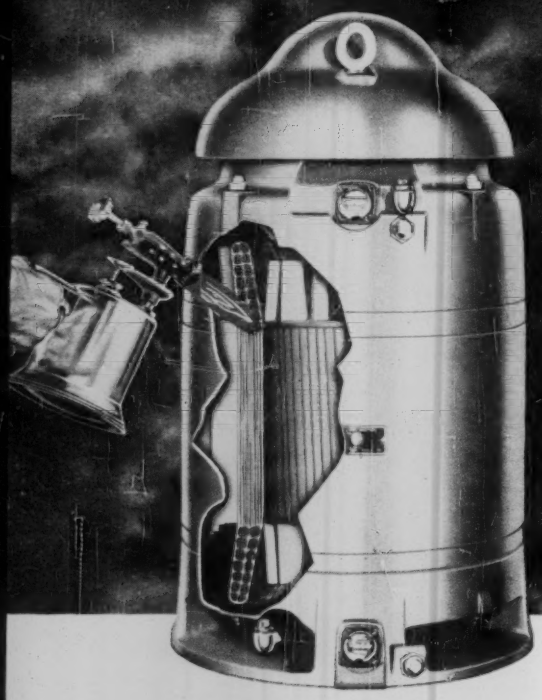

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descriptions which they immediately inherited upon completion of their military service.

As one who has held and still holds permanent civil status, GS-11 and 12, I resigned three different times and gave up over 15 years accredited service because of such procedures as outlined by Mr. Johnson in his article.

Until the government learns that registered engineers are not only on a par but above many "fringe" uniformed engineers, the nation is only going to get "fringe" engineering on its projects.

HARRY H. KIRCHNAN
Minneapolis, Minn.

Girder Erection Record?

SIR—We believe a record was set by our company this spring for length of steel plate girders erected in one piece.

On April 20, Steel Construction Co. erected two 185 ft steel plate bridge girders, each 10 ft deep, over the Willamette River near Newburg, Ore. They were lifted about 60 ft into position with two barge cranes and a truck crane.

We know of no girders of this length that have been previously erected in one piece. We would appreciate hearing from your readers on this point.

W. S. DIRKER
Office Manager
Steel Construction Co.
5300 N. W. Front St.
Portland 10, Ore.

A Mixup

EDITORS NOTE: Only spring can explain our treatment of two officials of the Pacific Gas & Electric Co. on pages 104 and 105 of the June 12 issue. In one item, H. W. Haberkorn, new vice president in charge of general construction, was incorrectly associated with the Pacific Power & Light Co. In the second item, Joseph Pirtz, Jr.'s, new position is manager of hydroelectric construction, succeeding Mr. Haberkorn. We had Mr. Pirtz placed in Mr. Haberkorn's present job.

CALENDAR

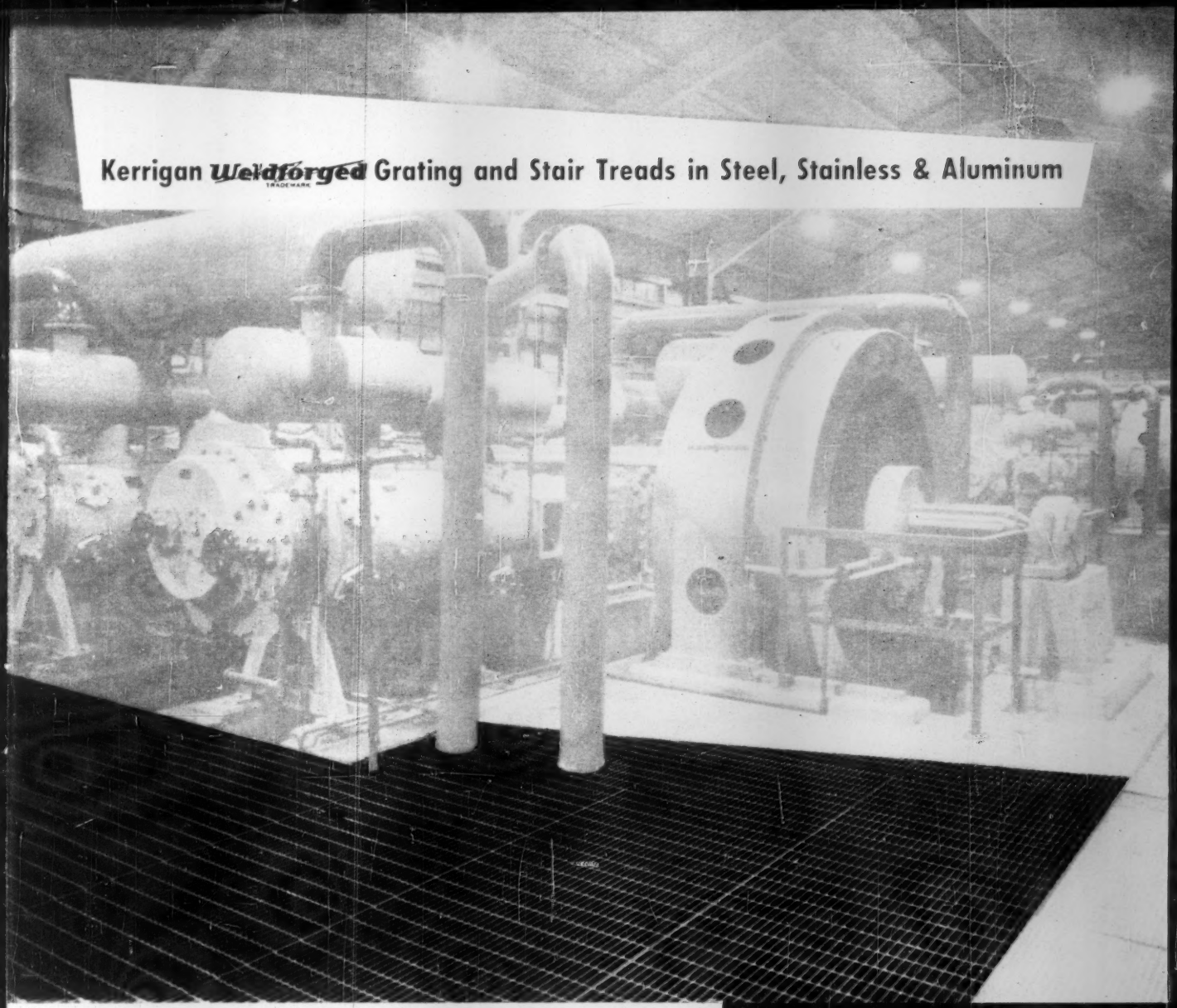
Association of Women in Architecture, national convention, Town House, Hotel, Los Angeles, Calif., June 30-July 2.

Construction Specifications Institute, annual convention, Hotel Cleveland, Cleveland, Ohio, July 5-7.

American Institute of Architects, annual convention, Hotel Cleveland, Cleveland, Ohio, July 7-11.

Expanded Clay and Shale Association, mid-year meeting, Cosmopolitan Hotel, Denver, Colo., July 20-21.

Kerrigan Weldforged Grating and Stair Treads in Steel, Stainless & Aluminum



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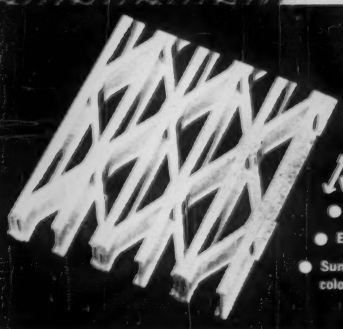

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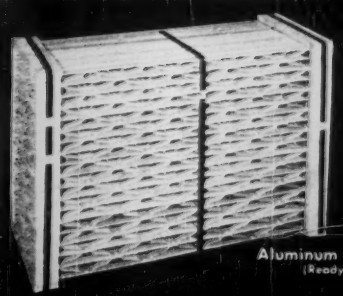

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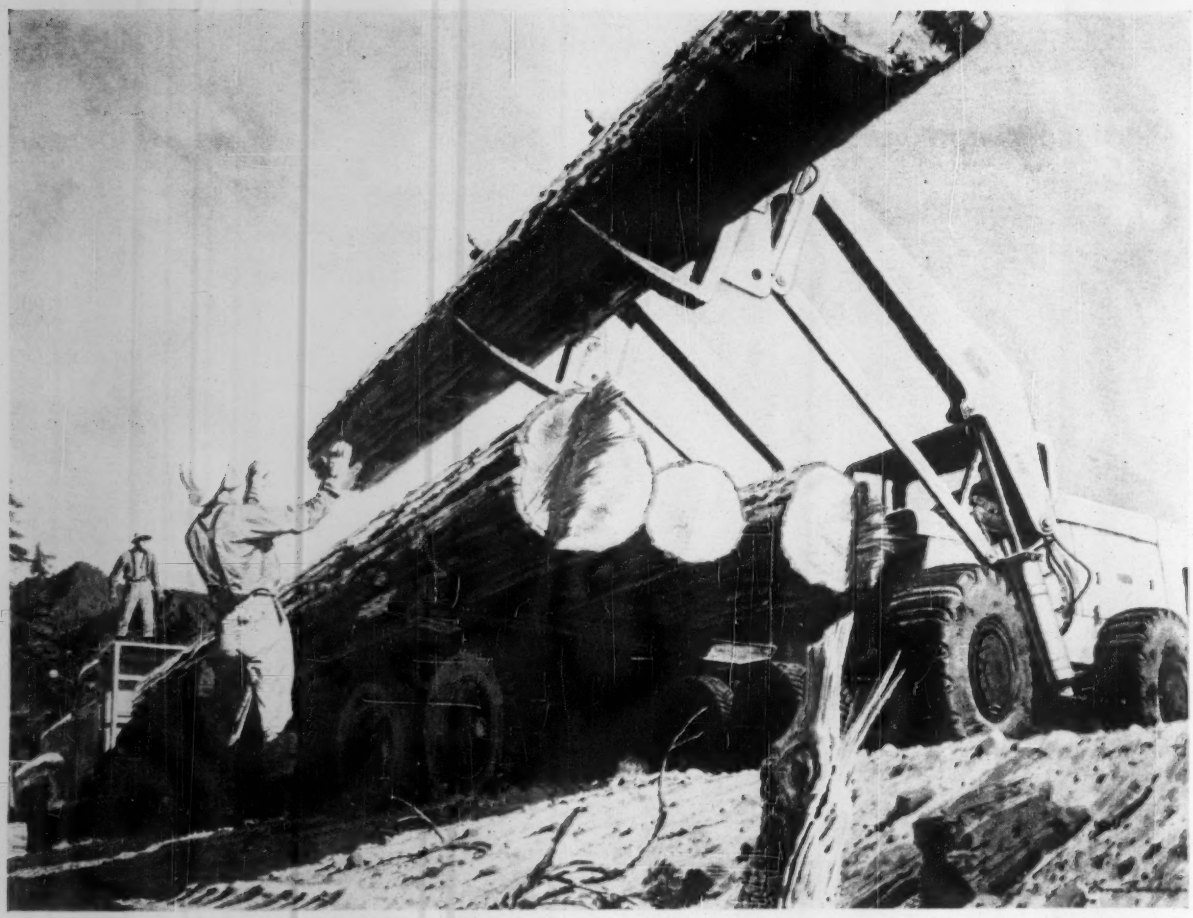
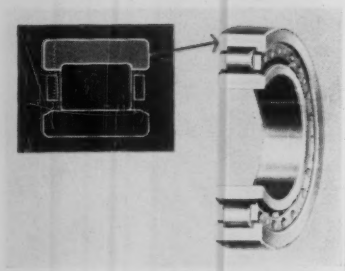


Loggers' "weight-lifter" tests bearing stamina!



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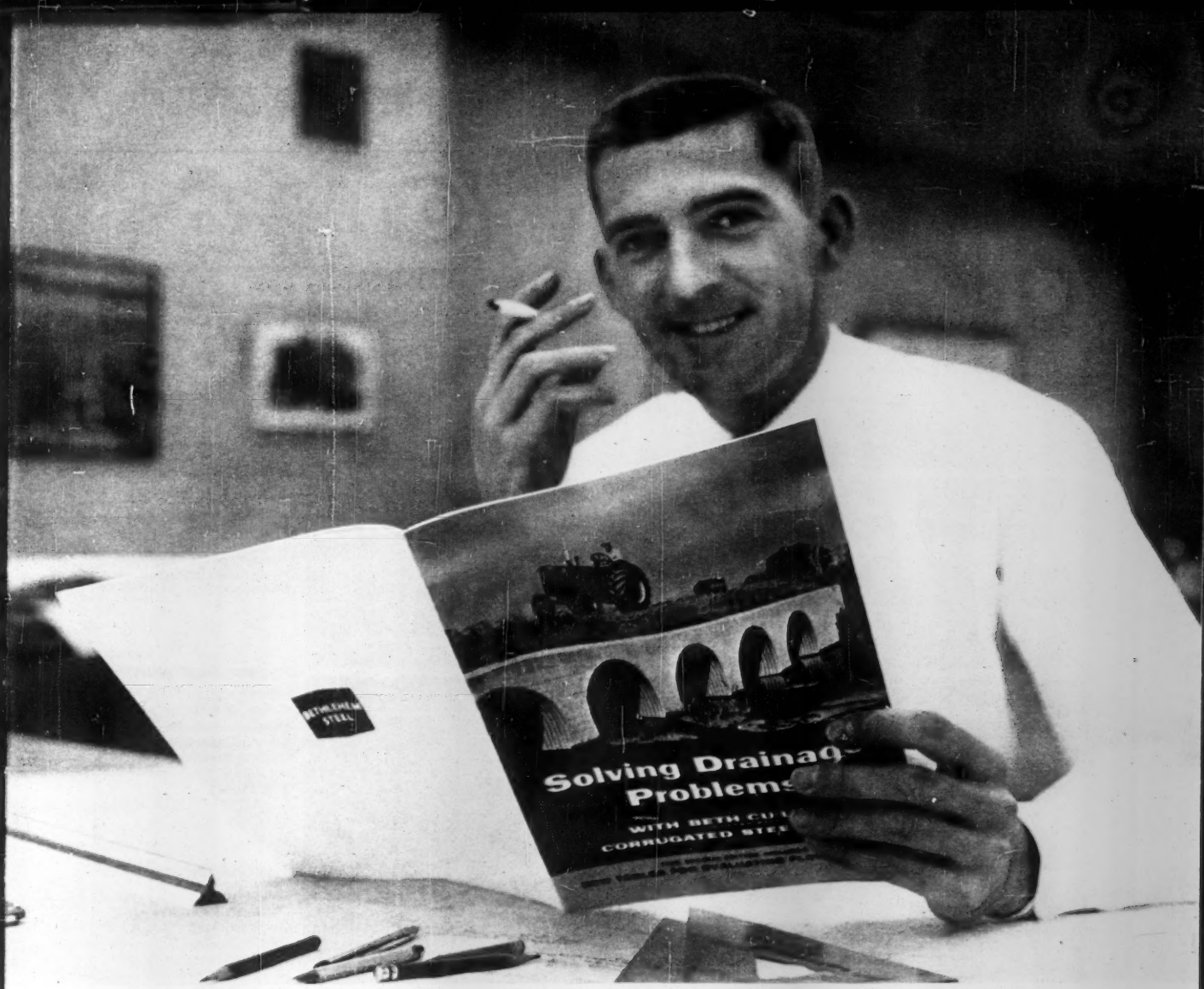

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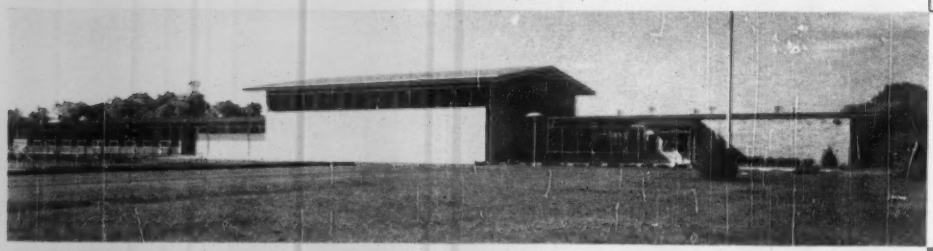

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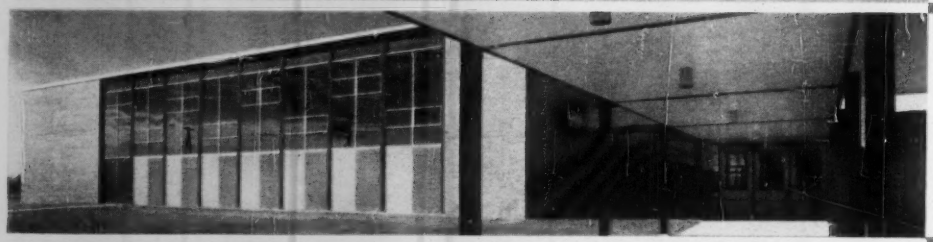

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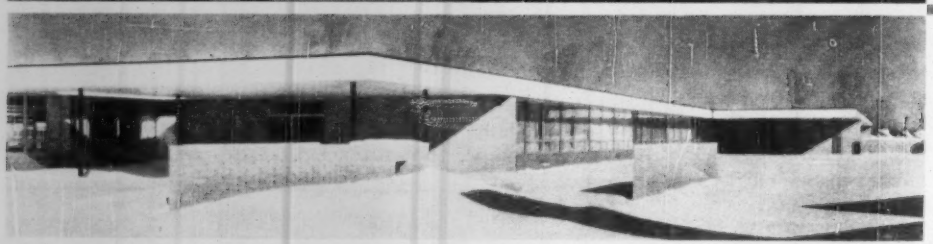

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ENGINEERING NEWS-RECORD

Vol. 160, No. 26 June 26, 1958

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THE CONSTRUCTION WEEK

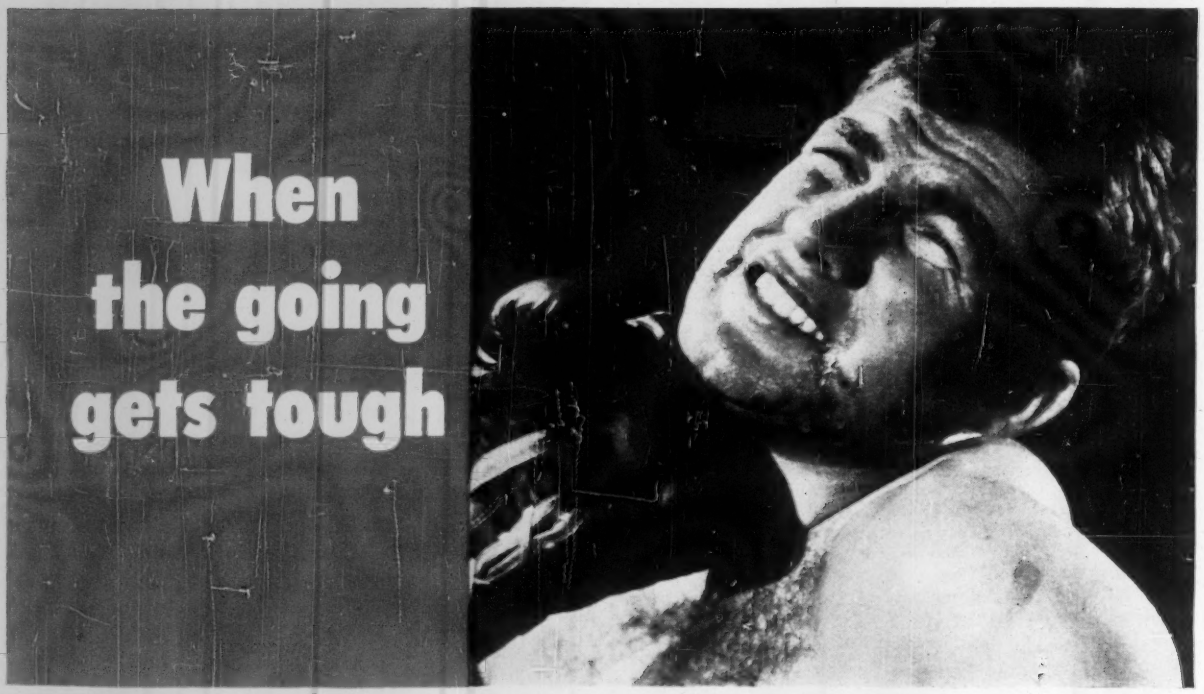
PUZZLE AT LEVITTOWN III—Will the Federal Housing Administration withhold mortgage insurance from builders who violate New Jersey's anti-discrimination law? State authorities say FHA Commissioner Norman Mason agreed to consider such a step where violations are proved. But Mr. Mason says the decision will be based "simply on whether a man is a good mortgage risk." FHA has no authority to enforce state laws, he said. Last week a Negro charged discrimination after his application for a house in Levittown III was refused.

FREE WORLD'S LARGEST RADIO TELESCOPE—The Navy plans to build a $60 million radio telescope for exploration of space and for transmitting jamming-free military information. It will be located near Harrisonburg, Va. Grad, Urbahn, Seleye, New York City, is the architect-engineer. The Navy Bureau of Yards and Docks will let the contract for the telescope and station. Electronic gear will be handled by the Naval Research Laboratory. Construction contractors may get contractor questionnaire forms from the Chief of the Bureau of Yards and Docks, U. S. Navy, Washington, D. C.

DANGER AT 10 DOWNING ST.—Repairs should start at once on the 300-year-old Prime Minister's quarters, No. 10 Downing St. in London. A major structural overhaul is needed. This advice was given by a British government committee. "It is impossible to rule out the possibility of a wall collapsing." Prime Minister Harold Macmillan, recommending the project in the House of Commons, made it clear the overhaul referred only to the building.

CORPS IS REBUFFED—The Corps of Engineers has lost out in its bid to be the maintenance agent for the St. Lawrence Seaway. President Eisenhower has given operational authority to Commerce Secretary Sinclair Weeks. He will wield it through the St. Lawrence Seaway Development Corp. Army Engineers' authority ends when construction is finished. The Seaway Corporation will handle maintenance and repair details with its own staff of people. Navigational aids, however, will be overseen by the Coast Guard under contract to the corporation.

PREVAILING WAGE UPSET—The New Mexico Supreme Court rules the state labor commissioner cannot set prevailing wages by guesswork or cover more than one locality in a single wage order. The court says the commissioner must "ascertain" what wage rates prevail in the "municipality or political subdivision" where the public works project is located. Contractors had challenged as "arbitrary and capricious" a wage order covering all workers in highway and street construction.



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- Vesuvius "X" Gear Compounds

WASHINGTON OBSERVER

- Highway standards issue up again
- Water storage authority expanded
- Congress will vote $400 million atom program
- Supreme Court clears Cowlitz River project

• **The Senate highway subcommittee will begin hearings July 11 on state variations in applying minimum standards for interstate highways.** This is the follow-up of the report made by the General Accounting Office for Sen. Albert Gore. It found variations among 11 states in following minimum standards in arriving at their cost estimates (ENR May 29, p. 22).

The hearings will relate to the billions to be split up among all the states—their allocations for 1960, 1961 and 1962. State officials and Bureau of Public Roads feel they can demonstrate in public hearings what they explained to Senator Gore in private sessions: that the differences in terrain, traffic volume and soils mean standards have to be interpreted differently. Shoulder widths, carrying shoulders across bridges, frequency of interchanges—all these could vary widely for a piece of road in Ohio, say, compared with Montana.

• **The Corps of Engineers and Bureau of Reclamation won a big issue** in the new rivers and harbors authorization legislation (see p. 26). Congress is now cleaning up the bill for final approval, and this major provision will be in the act sent to the President:

The agencies will be permitted to build space into their reservoirs to meet future water needs, deferring local repayment until the communities actually sign contracts for the water. To date, the Corps and the bureau had to have contracts for water in hand before building water supply facilities.

A companion provision allowing space to be built for low stream flow regulation was stricken from the legislation.

• **Congress probably will vote a $400 million atom power program.** A bill written by the Joint Committee on Atomic Energy will more than double the Administration's $193 million proposal.

Main points of the bill: Federal construction of a $145 million plutonium producing reactor at AEC's Hanford, Wash., works; a $51 million gas-cooled reactor to be built by the government unless the utility industry comes in with an acceptable proposal for private development.

Lesser items: Authorization of $8 million for design and engineering studies on a heavy water moderated and cooled reactor, as well as similar studies for three other reactors of unspecified types.

• **Last barriers to construction of a $146 million project on the Cowlitz River near Tacoma, Wash., have been pushed aside by the U. S. Supreme Court.** On Monday, the court ruled that a Federal Power Commission license to the City of Tacoma to build the hydroelectric project was valid and that Tacoma had the right to condemn state-owned property. The Washington State Supreme Court had ruled otherwise. The project calls for dams at Mayfield and Mossyrock, the former already begun and idled by the state court ruling.

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The unusual thing about this self-propelled loader is the fact that it is equipped with a *4-ply* belt which is turning out a more satisfactory performance than the *5-ply* belt it replaced. This 4-ply belt is a U. S. Rubber Giant® (style EN), 54" long, and is doing such a good job that the operator is very well satisfied with its excellent performance.

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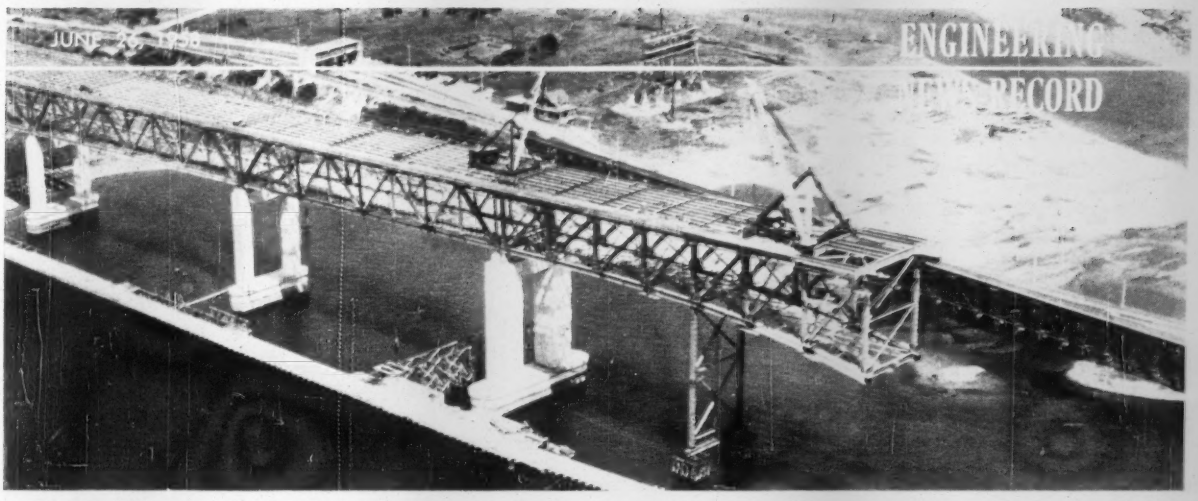
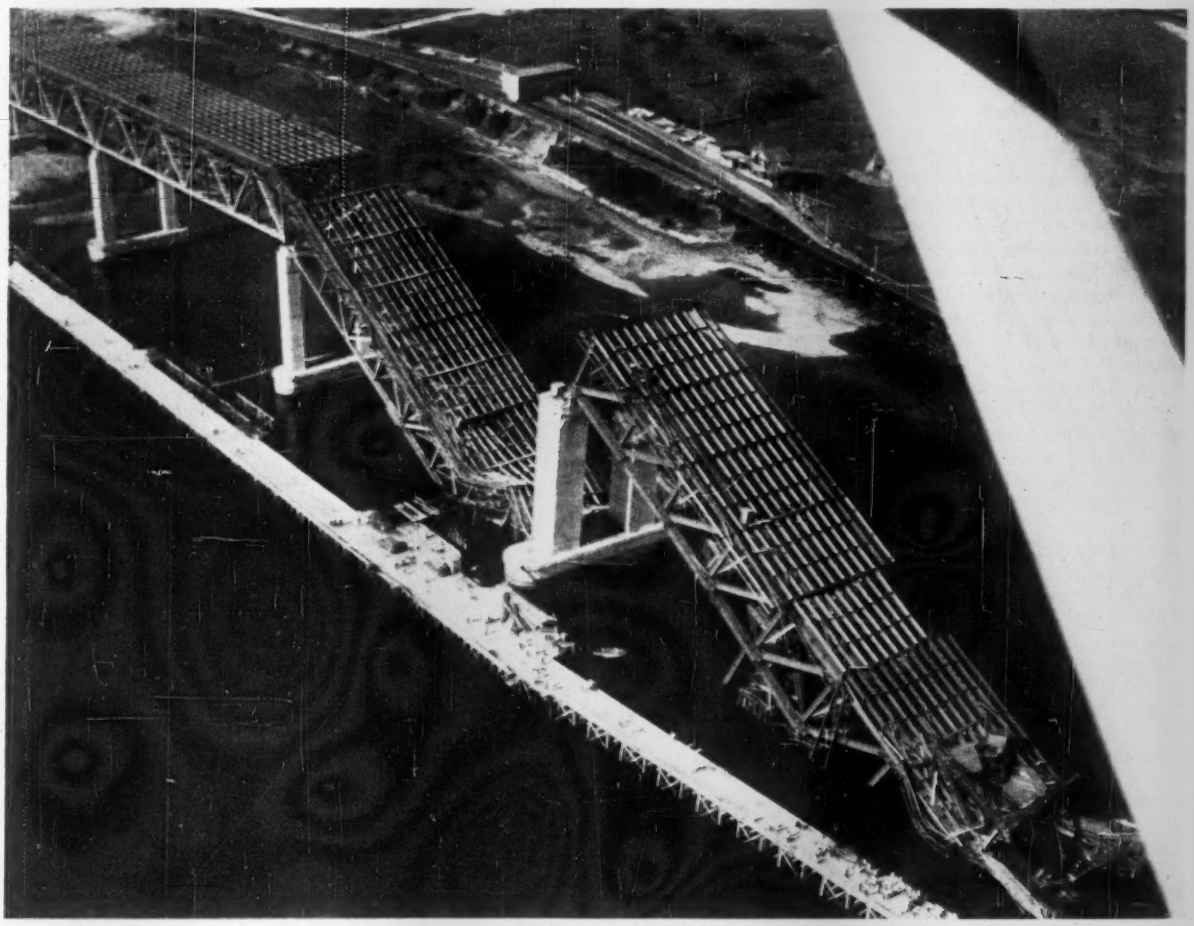


MONDAY Day before crash at partly completed Second Narrows Bridge in Vancouver, B.C., crews were extending trusswork over temporary supports toward main pier.



TUESDAY After fatal plunge, anchor span and one side span angle sharply into water.

What Happened at Vancouver? →

Story begins on p. 21

Probers Seek Cause of Bridge Collapse

Falsework buckled and plunged two spans of the partly completed new Second Narrows Bridge in Vancouver, B. C., into Burrard Inlet last week (pictures on previous page). At least 15 men died in the crash. Three others were still missing as ENR went to press; 20 were injured. The collapse will cost an estimated $3½ million.

Why the temporary supports gave way is not yet known. However, investigation of the disaster has begun under British Columbia's top jurist, Supreme Court Chief Justice Sherwood Lett.

• **Opinions Conflict**—Consulting engineers, contracting parties and government officials aren't talking for the record yet. But the unofficial consensus is that the permanent structure was not to blame. Questions likely to be asked by the commission: Was the falsework properly designed? Was it overloaded? Did something strike it? Did its temporary foundation slip?

Opinions and eyewitnesses accounts present a confused picture.

W. G. Swan, the chief bridge designer, said he feels the fault "must have been in the upper falsework" supporting the extended span. Some workers interviewed after the accident indicated that one of two cranes jockeying 50 ton girders into place on the anchor span might have snapped a cable and let a girder swing against the falsework.

The lift-span operator on the old Second Narrows Bridge nearby saw the collapse. "Two temporary legs supporting the end span about halfway out seemed to buckle," he said. A crane about two-thirds of the way out on the span slid about 50 ft to the waterline, where it tangled with bridge steel, he added. "There must have been about 15 men between the crane and the end of the span."

Another worker was fitting a beam into place at the end of the overhang and rode the span down. He said, "There was a split-second warning. The bridge groaned and suddenly sagged a few feet. Then it went all at once."

• **Second longest cantilever**—The wreckage was part of a $16 million six-lane bridge under construction between Vancouver and suburban North Vancouver. When completed, the structure will be 4,250 ft long. This includes a 1,100 ft steel-truss cantilever span, second longest in Canada; the rest of the bridge will be made up of two 467 ft steel-truss anchor spans, four 285 ft steel-truss simple spans and nine 120 ft prestressed concrete girder spans.

The bridge is being built for the provincial government as part of a $23 million express highway project included in the Trans-Canada highway network.

Begun in February 1956, the structure was to be completed this fall. Dominion Bridge Co., Ltd., is furnishing and erecting the 16,000 tons of superstructure steel under an $11 million contract. Peter Kiewit's Sons of Canada and Raymond International Co. completed the approaches and piers last December under a $4.3 million contract. Swan, Woster & Partners, Vancouver, are consulting engineers on the project.

• **Time: 3:40 pm**—The two sections that fell were the partly erected north anchor span and a completed steel-truss simple span next to it. Steelworkers progressing from the north had completed the four simple truss spans and extended the anchor span 345 ft toward the north main pier. They were moving additional steel out to the overhanging end at the time of the collapse on June 17.

At 3:40 pm the temporary bent supporting most of the 2,000 ton anchor span buckled. One end of the span pitched into the water. The impact was so great that the permanent concrete pier at the other end was jerked out of plumb by a few feet. This left the simple truss with no support, and it plunged into the water too.

There were 79 workmen on the two spans. Some managed to scramble to safety on the next span back. Others were catapulted into the fast tidal waters of the Second Narrows.

Here's where it happened.

• **Span almost made it**—The jutting steel frame of the anchor span had almost reached a second temporary support when the collapse occurred. The next day's work would have made it secure.

Seven panels of the trusswork in the span were up. Workmen were placing a bottom chord in the eighth panel. The falsework bent supporting the structure was located at the fourth panel. Each leg of the falsework was a built-up steel box member. Its 3 x 2½ ft rectangular cross section consisted of four 8 x 4 x ⅝ in. angles at the corners, two 36 x ¾ in. cover plates and two 28 x ⅝ in. cover plates. Supporting the column were 24 concrete-filled pipe piles.

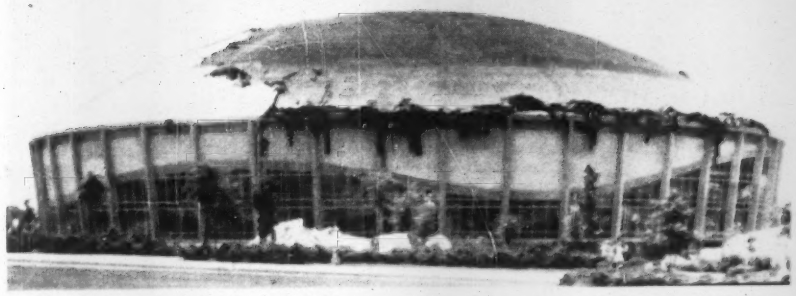
• **Erection procedure**—Steel was lifted to the bridge from a spur track by a 110 ton stiff leg derrick. A diesel locomotive on the bridge pushed the steel on dollies to a 110 ton traveler crane, which placed the material. For smaller steel components, there was also a 25 ton traveler crane. High-tensile bolts were used for all field connections.

None of the spans still standing were damaged, according to engineers who have examined them since the collapse. Although sections are tied together, it is believed that none of the standing parts were pulled out of position, except the pier between the two fallen spans.

• **Judge enlists bridge expert**—Chief Justice Lett has called in Montreal civil engineer Philip L. Pratley as engineer consultant and adviser to the Royal Commission looking into the accident. Mr. Pratley was a partner in a firm of consultants on the construction of two other Burrard Inlet bridges: the old Second Narrows Bridge, just east of the new crossing; and Lions Gate Bridge, downstream at the mouth of the inlet (see map).

• **Colossal salvage job**—Steel recovery will be a colossal task, salvage experts say. However, they believe at least half of the fallen steel can be salvaged and re-used. One salvage man thinks it will be necessary "to take out bolts and lift up steel piece by piece."

B. C. Highways Minister Philip Gaglardi reports the collapse will involve a loss between $3 million and $3½ million, including salvage costs, and will delay further construction six months.



In Charlotte, Wind Raised the Roofing

Nearly half the aluminum roofing went thataway when 75 mph gusts lashed the three-year-old, $3 million Coliseum in Charlotte, N. C. The 20 gage metal was nailed to expansion sockets in the fiber board covering of the concrete roof deck. It will cost about $40,000 to fabricate and install new roofing. Both insurance and guarantees cover the damage.

Architect A. G. Odell, of Charlotte, designed the 332 ft dia steel-framed structure. Thompson & Street, of Charlotte, handled the construction. Aluminum Structure Co., Pittsburgh, put the roof on.

In Burlington, a Boom Fell on 12 Cars

It happened when a crane handling steel beams got off balance and toppled over in Burlington, Ont. The falling load just missed nearby workmen. But the boom of the rig (125 ft long, including the jib) wasn't as considerate. It hit 12 cars, almost demolishing seven of them.

In New Castle, a Gymnasium Collapsed

One worker on the gymnasium said, "The collapse was so slow, I could have ridden down on the frame."

A meeting was held in New Castle, Ind., last Friday to determine the cause of the collapse on June 12 of the partially erected $1.1 million high school gymnasium. No statement was released after the meeting, pending completion of the steel erector's and its insurer's investigation.

Prior to the collapse (ENR June 19, p. 19), four of the nine welded steel arches spanning the 200 ft wide gym had been erected. Only one line of permanent roof purlins was welded in place. Wire rope guys bracing the frame had been removed at 9 o'clock the morning of the collapse. Why they were removed hasn't been revealed. At 1:15 PM, the frame sagged slowly to the ground. It started with the third truss, which pushed and pulled the others down with it.

Near Denver, a 60 Ft Earth Dam Sunk 11 Ft

Nine months after its crest was raised 12 ft, a 1,900 ft long earthfill dam near Denver settled and shifted last week endangering the structure.

A 600 ft length of center section, was 61 ft above riverbed, settled 11 ft vertically and moved downstream more than 14 ft.

The cause apparently was an unstable clay base that compressed in the shape of a camel's back when viewed in transverse section.

The collapse occurred Sunday, June 15, at the Great Western Reservoir in Walnut Creek, 15 miles northwest of Denver. The movement threatened to burst the dam and flood 60 farms, two major highways and a railroad below the 3,263 acre-ft reservoir, which was filled to the brim.

Emergency crews worked five days around the clock moving in 10,000 cu yd of fill, at the same time lowering the reservoir level from a depth of 60 ft to 54 ft. On Wednesday, State Engineer J. E. Whitten said the "big danger is over." However, he ordered reservoir spilling to continue until water depth was 45 ft.

• **Old dam**—Great Western Dam was constructed in 1907 for irrigation purposes, but lately has been used for domestic water supply. Its base is 300 ft wide. The upstream side of the dam has a 6 in. gravel blanket and 18 in. of riprapping over compacted earthfill.

Plans for raising the dam 12 ft to a 61 ft height above riverbed were prepared by Van Sickle Associates, Denver, and approved by Mr. Whitten in September 1957.

The failure was in the form of a horseshoe in plan, with lateral movement at each end about 10 ft and more than 14 ft at the center, Mr. Whitten said. There were numerous shear planes in the 600 ft section, rupturing the dam's water supply outlet pipes.

Paul Norris, engineer for Jefferson County, where the dam is located, said the dam is founded on an unstable base of alluvial clay. The clay sets on a bed, which is believed not to have settled.

Mr Whitten said the owner of the dam has the alternative of rebuilding the structure or constructing a new dam downstream, either of which will cost in excess of $300,000. Owner is the Turnpike Land Co., which developed the new community of Broomfield Heights a short distance from the dam. There are now 5,000 residents in towns whose water is drawn from the reservoir.

Water service to the community was reinstated four days after the sudden settlement of the dam.

Labor Bill Hits a Rocky Road

Conflicting views within the construction industry are among the pitfalls that lie ahead in the House debate

The 1958 union control bill is at the half-way mark with no serious opposition from either labor or management. But it still has only a slim chance of becoming law this year.

When the measure becomes the subject of debate in the House, neither labor nor management will make any strenuous objections. Both will seek changes, although they generally approve of its major points. The AFL-CIO already has said it contains "enough substantial anti-corruption sections to make it worthwhile" and would apparently rather settle for this than risk tougher legislation.

Labor's general approval applies also to the bill's construction amendments.

However, chances of House action on any anti-racketeering measure this session are slight. Despite the Senate's 88-to-1 vote for the moderate measure, some key House members are reluctant to become involved in labor legislation this session. Only a major push by the top Democratic leadership could change this.

The bill is officially known as the Labor-Management Reporting and Disclosure Act of 1958.

Essentially, it's directed at controlling union corruption. It requires unions and their officers to make reports on financial transactions—and provides criminal penalties for false filing. It imposes internal rules for unions; calls for secret ballot elections of union officers at least every four years and contains further checks on union misconduct.

There are also a number of amendments to the Taft-Hartley Act. One would permit strikers to vote in representation elections, long sought by unions. Another would ban shakedown picketing, a management goal. A third would require the National Labor Relations Board to take all cases except those specifically ceded to the states that have their own Taft-Hartley Laws.

• **Construction amendments**—Changes written into the bill and directed specifically at the construction industry are these:

• Building trades unions and contractors would be permitted to make pre-hire agreements. This means they can have a contractual working arrangement before a project is begun, partly to enable a contractor to bid on a job with an understanding with the union on wage rates—generally following an area pattern. It would not, however, affect the present ban on discriminatory hiring practices.

• Under such an agreement, workers on a project would be required to join a union after seven days, instead of the 30-day period required now by the Taft-Hartley Act. This is to answer building trades' objections that construction jobs are frequently too brief for the 30-day period to be effective.

• Also, employers would be required to notify the craft union signing the agreement of hiring opportunities, and the union is given a chance to refer applicants before the jobs are publicly thrown open.

• The pre-hire agreement would require workers to meet certain minimum training and other requirements, and specify that length-of-employment with the contractor in the industry or area is a basis for preferential hiring. (Not to be confused with preferential hiring based on union membership.)

In a second construction amendment, the 1958 union bill has a clause permitting contractors to contribute to trust funds that provide pooled vacations and apprentice training for craft workers.

These two amendments are not regarded as drastic changes in hiring practices in the construction industry. But they are designed to ease some of the present features of the law to make it fit the transient hiring operations peculiar to construction.

• **Some differences**—AFL-CIO building trades officials say the construction amendments are fine, even though the new bill doesn't include the changes they particularly wanted. They'll support the bill, while seeking amendments in the coming House debate.

To contractors, particularly the Association of General Contractors, the measure as a whole is a "forward step." However, the AGC has some objections to the construction amendments. It prefers a certification without-election proposal that lost out to the pre-hire agreement. And it favors employer payments into apprenticeship funds, but has reservations about pooled vacations.

The certification-without-election proposal originally was sponsored by both the AGC and the AFL-CIO Building and Construction Trades Department. However, Building Trades President Richard J. Gray shifted his sights because of the impact that such procedure could have on the jurisdictional interest of unions.

The AGC objects to the change. It will pressure the House Labor Committee, when the time comes to drop the pre-hire plan because it doesn't require that an employer and a union have a prior bargaining relationship before they sign an agreement as the certification proposal would.

The pre-hire amendment will not change any existing hiring rules. The National Labor Relations Board, in a ruling known as the Pacific Mountain Case, says there can be no discriminatory hiring in the construction industry. This bars the unions from offering only union members through the union hiring hall. It requires them to offer non-union workers too, where their qualifications permit. After September 1, the NLRB plans to invoke a drastic punitive remedy knowns as the Brown-Olds rule for violations.

The hiring hall ruling would still stand, even though unions could sign up with employers before a project begins. Construction unions would still be required to allow non-union workers to pass through the hiring hall and be hired according to experience, qualifications, length of service to a contractor.

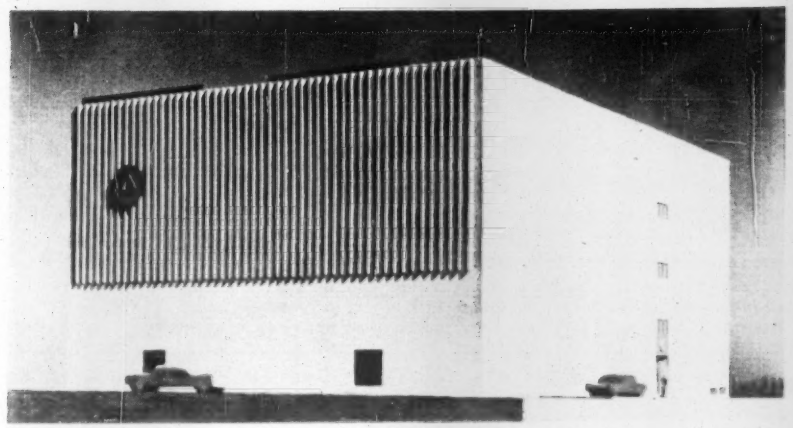
• **What's ahead**—When the union control bill comes up for debate in committee or on the floor, both the AFL-CIO Building Trades Department and AGC will be seeking some changes.

They'll give the measure some qualified support. The contractors like the anti-rackets clauses and are particularly pleased that the bill omits something the construction unions had sought—the right of craft unions to picket construction sites that have more than one contractor. This was dropped on the Senate floor during debate, when the Eisenhower Administration didn't repeat its request for a clause that would lift the secondary boycott ban on such picketing.

Craft union leaders will ask again for this liberalizing secondary boycott amendment, and repeal of the Taft-Hartley provision that allows state right-to-work laws. But this will be largely a bargaining position. They aren't unhappy with the measure as it is.

On the other hand, AGC will seek a stronger secondary boycott section than that now contained in the law. They'll also press for the certification amendment as a substitute for the pre-hire clause.

This type of debate at forthcoming House committee hearings will tend to minimize the chances of final passage even if the Democrats try to push the bill through the House to protect election interests.



Precast Panels to Rise 61 Ft

The tallest concrete wall panels ever precast will enclose a new switching and transformer station under construction in Newark, N. J. The sections will be 61 ft high and 4 ft wide.

The panels also will have other features not common in concrete walls: double-tee cross section, prestressing and sandwich construction.

The double-tee is common for precast floor and roof beams, but its efficiency in resisting the bending loads involved in those applications is seldom needed in walls. In this case, however, the wall sections will span up to 26 ft vertically between supports—floors and roof—and will cantilever as a parapet wall for the top 14 ft of their height. The design wind load of 30 psf on these spans will induce sizable moments. Stems of the tees will project on the exterior face of the panels. Spacing of the stems will be 24 in., depth 8½ in.

The members will be pretensioned. Cables will be located so that the prestressing forces will act along the neutral axis. Thus there will be no camber, in contrast to the usual practice in prestressing beams.

The bar of the tee will be a 5½-in.-thick sandwich—two 2 in. layers of concrete separated by 1½ in. of plastic foam or glass fiber insulation.

The building will be 103 x 157 ft in plan. It will have a full basement, structural steel frame and concrete floors and roof. The tall panels will be all exterior walls except at one end, where concrete block will serve temporarily, and at transformer bays, where removable flat precast concrete slabs will be used for the lower 24 ft for easier transformer maintenance.

The 61-ft-high units will weigh about 10 tons each. Joints between the tongue-and-groove edges will be caulked with oakum and sealed with synthetic rubber.

The building is expected to be completed next summer. It was designed by the electric engineering department of Public Service Electric & Gas Co. The office of Alfred Easton Poor, New York City, is the consulting architect and was responsible for design of the prestressed sandwich panels. Edward M. Waldron, Inc., of Newark, is the general contractor.

Educators Want More Research

Engineering educators meeting at the University of California in Berkeley last week were unhappy because they aren't getting as much research work as they'd like.

One man said the U. S. has lost 549 man-years of research time in the last 12 months. Reason: Funds were not available to fully utilize engineering college faculties.

The speaker was Prof. Robert H. Ramsey of Pennsylvania State University. He spoke to 1,000 members of the American Society for Engineering Education at the group's annual meeting.

Professor Ramsey presented the final report of a 12 month survey of research capabilities and potentialities in the nation's engineering colleges. It was sponsored by a National Science Foundation grant.

"Some $10 to $25 million could be put to use immediately to bring latent research capacity in the engineering colleges up to full force," Professor Ramsey said. "Such a program also would require expenditure of $180 million in equipment and buildings. Much of this expenditure, however, would serve the dual purposes of instruction and research."

From July 1956, to June 1957, the colleges were found to have spent $86.4 million on engineering research. The largest portion, $53.4 million was government-sponsored military work; $10.6 million was non-military government work; $11.5 million, industrial contracts; $7.1 million, university sponsored; $2.7 million, industrial grants; and $8.2 million from other sources.

Karl B. McEachron, Case Institute of Technology, suggested that universities make a direct approach to industry in asking for research money. This should include grants as well as fellowships which also would provide sufficient funds to the schools for overhead, he said.

The ASEE report, he said, shows that industrial support of college research is at a very low level. To get more help, schools should take the initative in approaching industry with research programs directed toward their mutual benefit.

• **Government is big spender**—Speaking on the role of government in university research, Gene M. Nordby, program director for engineering sciences, National Science Foundation, said more than two-thirds of the research money in educational institutions is provided by the federal government.

The government's research program puts emphasis on basic engineering sciences. These researches are usually performed by workers whose designation is one of the conventional departments of engineering.

• **Against scholarships**—Discussing another type of federal aid, engineering educators at a press conference expressed their opposition to the federal bill to aid education (HR 12630). They need more teachers, they said, not more students. They agreed the bill should provide money for graduate studies, to be tied in to the requirement that graduate students teach as they learn.

Speakers at a manpower session agreed there is still a high demand for engineers. Harold Goldstein, U.S. Department of Labor, Washington, D. C., said engineers have suffered relatively little in the recession, although it has been concentrated in industries that employ many engineers. In spite of dropping industrial investment, research and development expenditures are expected to grow during the next five years. That should result in a higher demand for engineers.

Henry H. Armsby, chief for engineering education in the U.S. Department of Health, Education and Welfare, reported on a survey of engineering colleges prepared by the Engineering Manpower Commission of the Engineers Joint Council. He said civil engineers appear to be most in demand; 77% of new graduates have taken or are about to take jobs.

Rivers Bill Veto Held Unlikely

Congress this week planned to send a compromise $1.6 billion rivers and harbors authorization bill to President Eisenhower for his approval (see table below).

Washington observers are confident the current bill will not be vetoed, as the last two were—first in 1956 and again last April. The slightly revised third edition has been cleared of most possible Presidential objections, through concessions on both sides.

The new authorization measure is a life-saver for many basin projects that have been under way for years, but are still far from completion. Some of them would have to taper off or shut down construction operations completely in the next 12 months, if the money were not authorized during the present session of Congress.

Conspicuous among the basin undertakings that would run out of spending authority this year are the central and south Florida project, the Columbia River Basin, the White River, the Kaweak and Tule Rivers, and the Los Angeles County project. Equally important, if not so immediately critical, are increased authorizations for vast projects like the Missouri River Basin, which gets $200 million for the Army Engineers and $200 million for the Reclamation Bureau. None of these projects has suffered from a lack of appropriated funds. The money was forthcoming, but the agencies could not spend it while the White House blocked the authorization bill.

These big additions to existing spending authority, however, are only part of the boost that the new bill gives to future construction. Congress approved some 150 projects costing more than $200 million for construction in the months and years ahead. More than 20 of the new projects, as the table shows, will cost the federal government from $10 million to $53 million each, based on present cost estimates. And the $50 million or so of federal contribution authorized for flood control allocation at Oroville Dam in California will provide about 15% of the cost of this state-planned structure.

Three of the large projects—hurricane protection for New Bedford-Fairhaven-Acushnet, Mass., and for Narragansett Bay, R. I., and a reservoir for the Mahoning River, Ohio—are slated for a quick start. Money is now being voted by Congress in its annual public works appropriation bill. Several smaller projects also are getting starting funds in the same measure which will enable them to begin construction within the next 12 months.

Some other projects on the list authorized by the new bill will get starting money from Congress next year. But the majority will have to wait longer. It is hard to forecast chances a year ahead, but it looks now as if the Delaware River anchorages, the Old and Atchafalaya Rivers, Baltimore Harbor, Salt Creek in Nebraska, Cleveland Harbor, Millwood Dam of the Red-Ouachita project, and Galveston Harbor-Houston ship channel have as good a chance as any among the larger authorizations for getting money to start construction from the next Congress.

Here Are the $10-Million-Plus Projects Congress Approved and Sent to the President

(add 000)

Project	Amount Authorized
Tombigbee River (Ala.)	$19,311
St. Francis River Basin (Mo. and Ark.)	35,674
Oroville Reservoir (Calif.)	50,000
Trinidad Reservoir (Colo.)	16,628
Delaware River Anchorages (Del.)	24,447
Kaskaskia River (Ill.)	23,000
Upper Wabash River (Ind.)	45,500
Saylorville Reservoir (Iowa)	44,500
Old and Atchafalaya Rivers (La.)	28,200
Baltimore Harbor (Md.)	28,161
New Bedford-Fairhaven, Acushnet (Mass.)	10,480
Saginaw River (Mich.)	16,085
Salt Creek and tributaries (Neb.)	13,314
Susquehanna River Basin (N.Y., Pa.)	30,000
West Branch Mahoning River (Ohio)	12,585
Cleveland Harbor (Ohio)	14,927
Red-Ouachita River Basin (Okla., Ark.)	53,235
Yaquina Bay (Ore.)	19,800
Turtle Creek (Pa.)	13,417
Narragansett Bay area (R. I.)	11,550
Galveston-Houston Channel (Tex.)	17,196

Basin Authorizations

Project	Amount Authorized
Connecticut rivers	$24,000
Hartwell Reservoir (Ga.)	44,300
Central and South Florida	40,000
White River projects	57,000
Upper Mississippi River projects	21,000
Missouri Basin (Corps of Engineers)	200,000
Missouri Basin (Bureau of Reclamation)	200,000
Sacramento Basin (Calif.)	17,000
San Joaquin Basin (Calif.)	13,000
Kaweak and Tule Rivers (Calif.)	29,000
Los Angeles flood control project	44,000
Columbia River Basin	112,000

Navajo Dam Bids

Morrison-Knudsen group is low at $22.8 million

Apparent low bidder last week for construction of Navajo Dam, a 26 million cu yd earthfill in the Upper Colorado River Project, was a joint venture composed of Morrison-Knudsen Co., Henry J. Kaiser Co. and F and S Construction Co., of Los Angeles.

The low price of $22,822,624 was well below the next bid of $25,784,997, submitted by a group headed by Winston Bros. Co. It was also below the Bureau of Reclamation's estimate of $28.4 million.

The Navajo opening, in Farmington, N. M., attracted 12 bidders whose prices ranged up to $40.8 million. An award is expected before July 1.

• **Huge earthfill**—Navajo Dam is the third major feature of the Upper Colorado River Project to be called. Glen Canyon Dam has been under way for two years. Bids on Flaming Gorge Dam were opened last week (ENR June 19, p. 26).

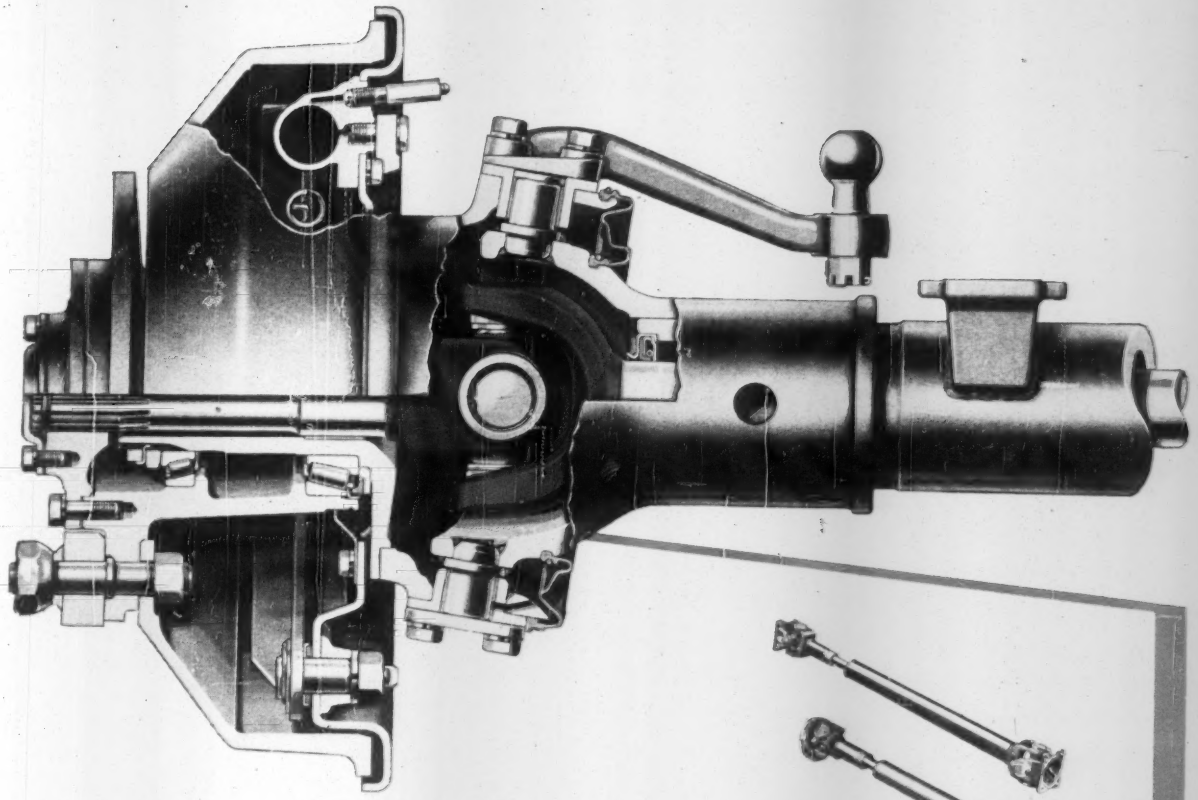
Navajo Dam will rise 388 ft above the San Juan river bed in the northwestern corner of New Mexico. It will have a crest length of 3,800 ft and back up a 1.7 million acre-ft reservoir.

As in the case of Flaming Gorge, primary purpose of Navajo is river regulation. It has no power plant. But it will permit irrigation of 110,000 acres of Indian lands.

The earthfill section of Navajo Dam is designed to make maximum use of available materials. It has a central impervious core of compacted clay, silt, sand and gravel totaling 9.5 million cu yd. Surrounding the core is a pervious zone of sand, gravel, cobbles and boulders totaling 11.3 million cu yd. This zone is relatively thin downstream from the central core. And it surrounds, on the downstream side, a mass of miscellaneous fill totaling 5.4 million cu yd. This latter zone is aimed at making use, for mass purposes, of available materials that otherwise might not be used. Earthwork bids were right at 36 cents or 37 cents per cu yd.

Haul distance for all materials is relatively short, maximum being about 2 miles. Most of it is closer, with the bulk of the impervious fill coming from the river bed just downstream from the dam. Water table is fairly high in some areas and this may present problems to the contractor.

The San Juan River will be diverted through two concrete lined tunnels that will later serve as outlet tunnels. The main outlet tunnel is 18 ft 9 in. ID and about 1,650 ft long. The auxiliary outlet tunnel is only 7 ft ID.



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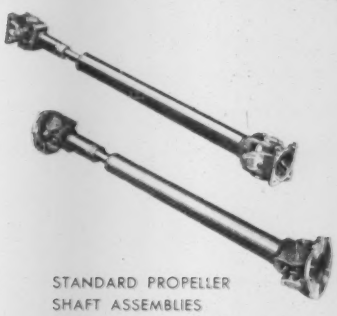

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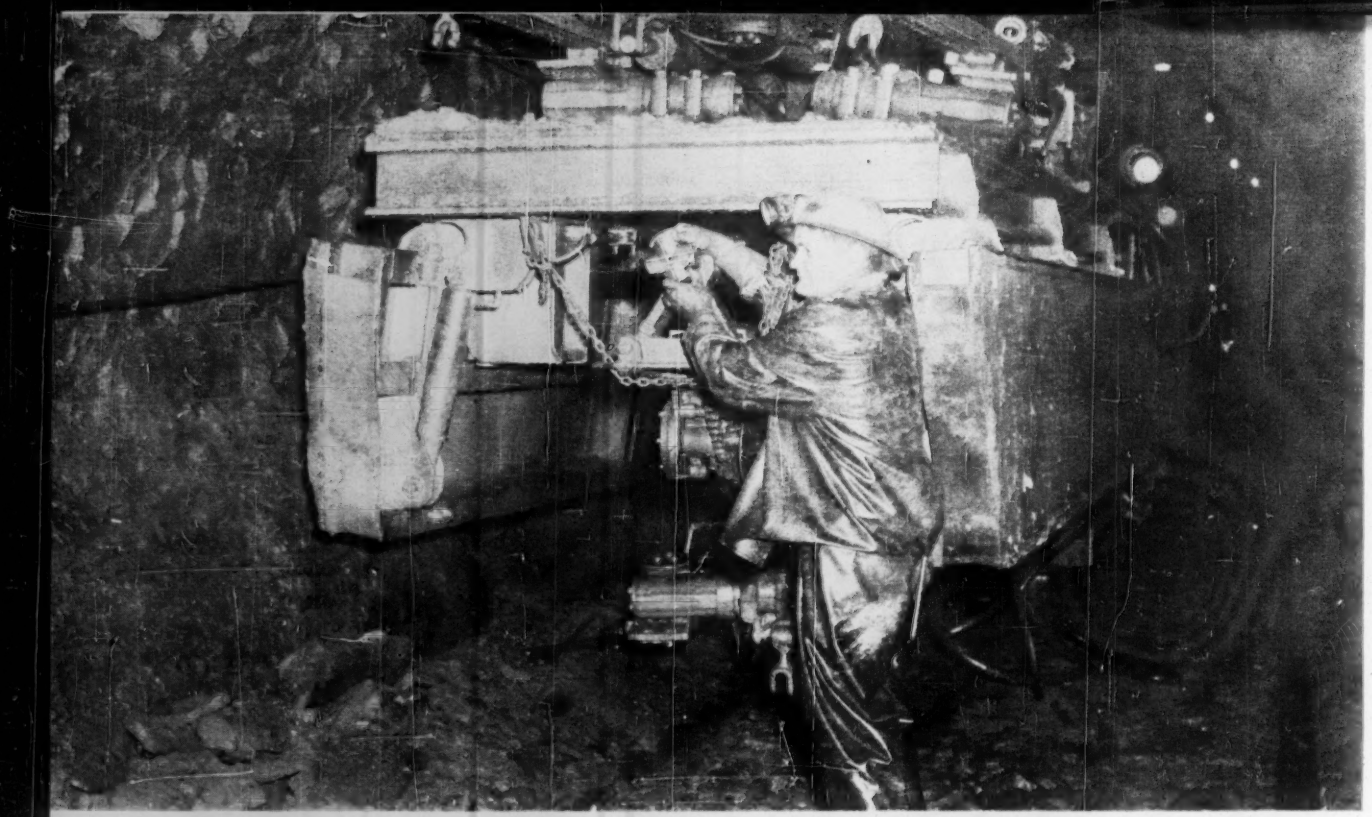


5" DRILL, a king-size drifter on hydraulic booms, helped set world tunneling record on 44 mile West Delaware Tunnel.

Two Contractors Prove Out New

One contractor on New York City's 44 mile West Delaware Tunnel has laid claim to a new world tunneling record—83 ft daily advance averaged over a week. A second contractor on this same hard rock job through Catskill Mountain grey sandstone and shale is not far behind, at 80 ft daily advance through the 13½ ft dia bore.

Best previous work was 80 ft a day in 1955, according to ENR records. That was on the North of Scotland Hydro Board's Glen Almond Tunnel, a 10 ft horseshoe.

Many factors enter into this fast work on the West Delaware Water Tunnel. The most important is use of "burn" holes, or "burncuts", in the drilling pattern by both contractors. These are large-size holes drilled near the center of the pattern to eliminate awkward pyramid drilling. While not unknown in mining work previously, burncuts had never been given much of a trial in tunneling work until the West Delaware job. Most tunneling men believed too much reliance was placed on one larger drill—if it broke down, the job would be delayed.

Now it appears this view will be altered. With 18 miles of tunnel driving completed, Clancy O'Dell and R. P. King, project manager and engineer, respectively, for Drake-Grafe-Winston-Tecon-Conduit, believe burn holes will become standard practice in hard rock tunneling. It is the Drake group, holder of four of the five West Delaware tunnel contracts for 39 miles, that claims the new world record.

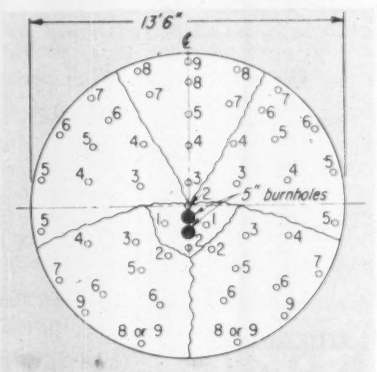
Eugene Tufts and Arthur Chase, superintendent and former project engineer for MacLean-Grove Brewster, which has driven four of its five miles, say that the modified wagon drill being used for burncutting is performing very satisfactorily.

The DGWTC combine, on the job since late 1955, approached the burncuts slowly. Two 3 in. dia holes were drilled one above the other in the first heading—driven from what will be the inlet portal at Cannonsville Reservoir (see profile). Here average advance per round was 9.3 ft. In headings east and west from Shaft 1, 4 in. dia burn holes were employed and advance per round averaged 10 and 10.1 ft.

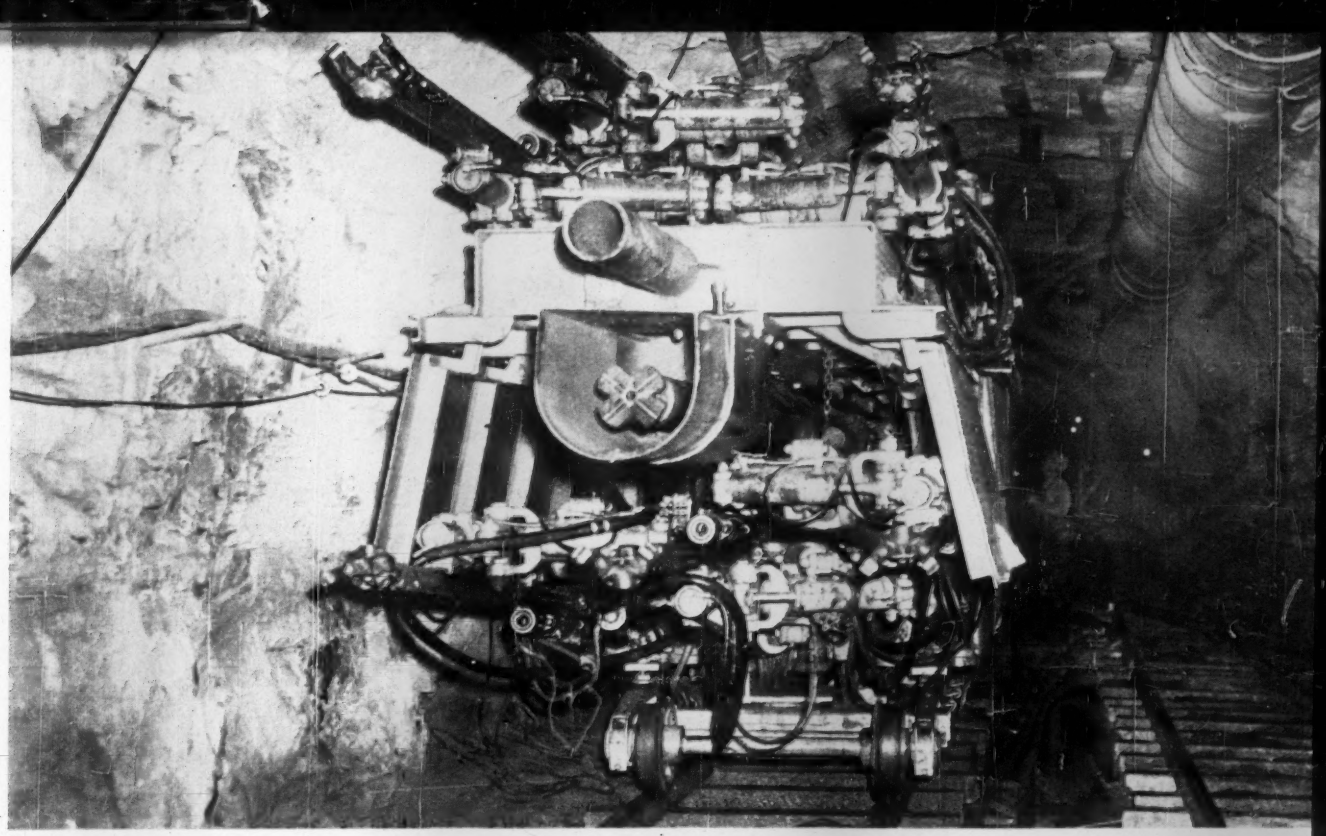
Twin 5 in. dia burn holes are being employed in the current DGWTC headings from Shafts 2 and 3, as shown in the illustrated drill pattern. Advance per round is up to 11.0 ft. The contractor expects to retain this pattern for headings from Shafts 5, 6 and 7 and the outlet portal in Rondout Reservoir. However, DGWTC has indicated it may try the burn hole setup the second contractor is employing. The 5 in. drill employed is a Gardner-Denver Model 143 air powered percussion type.

Benefitting from DGWTC's experience, MacLean-Grove Brewster began right in using a single 8 in. dia burn hole in its two headings from Shaft 4. MGB tunnelers are also now achieving an 11.0 ft advance per round, and

THE METHOD: Hollow



5" DRILL makes twin "burn" holes, provides core that rest of pattern shoots for.



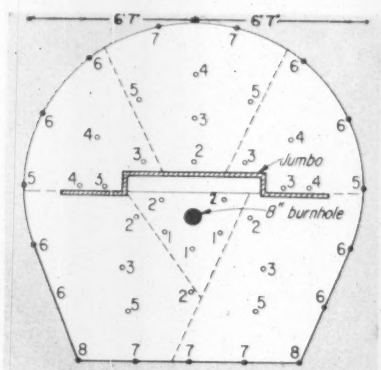
8" DRILL, "down the hole" type fixed to a jumbo frame, is also doing fast job on the West Delaware project.

Hard Rock Tunneling Method

likewise an average daily advance per heading of 65 ft (see table). The 8 in. dia drill is a modified Model DHD-400 percussion unit by Ingersoll Rand.

• **Advantages of burncuts**—The burn holes used by both contractors provide relief for the exploding dynamite in the 12 in. dia horizontal blast holes in the rest of the pattern. The larger holes are not loaded.

core in the drill pattern



8" DRILL makes one "burn" hole. Both drills eliminate tough angle drilling.

Here's a comparison of burn holes and conventional pyramid drilling of regular blast holes. Burn holes produce more muck per blast; the muck is more concentrated to allow faster mucking. There also is less overbreak with the burn holes.

DGWTC finds drilling the two 5 in. holes in each face for a 12 ft length requires about 50 minutes using one drill steel. Drilling time for the remaining blast holes averages 85 minutes. The single 8 in. hole is drilled in an average 50 minutes.

• **Large drills used**—Drake began the job using a conventional drill pattern, so its drilling jumbos make no special provision for the hefty 5 in. burncut drifters. The big drill simply replaces the middle drill of the lower group and is mounted on the same hydraulic boom that held the regular 1¾ in. drifter. Some difficulty was experienced in moving the large drill with the regular booms.

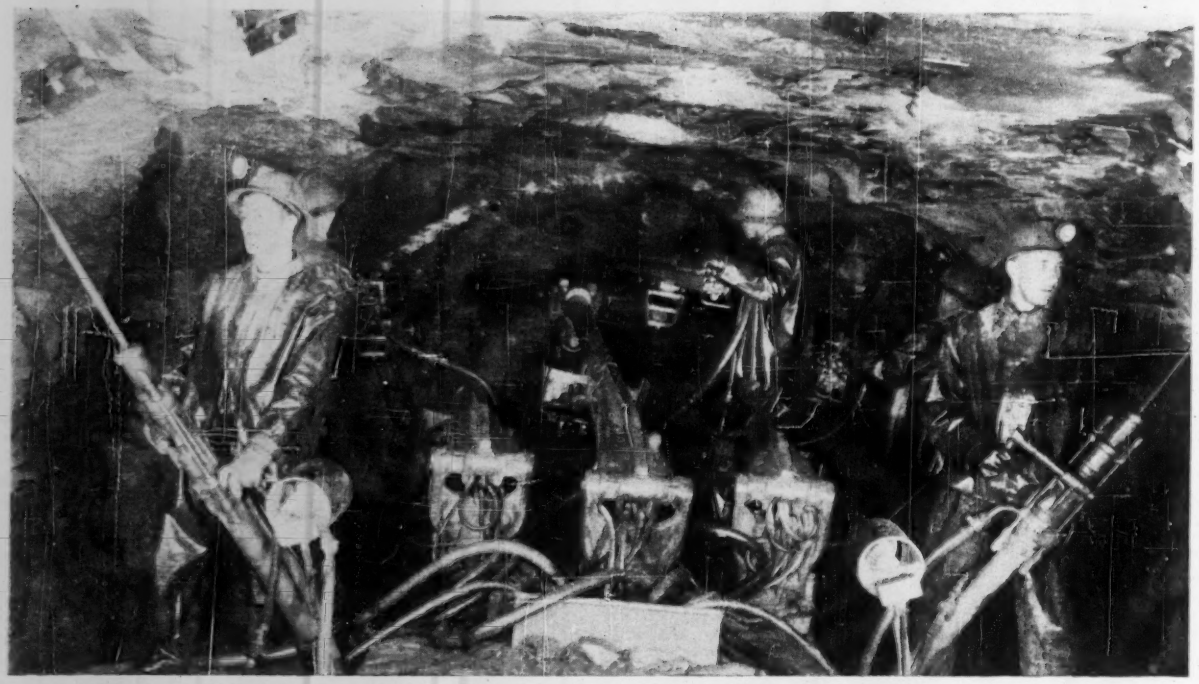
The DGWTC jumbo is a steel framed carriage, 36 ft long, with six hydraulically operated booms and drill positioners, manufactured by Gardner-Denver Co. It is run on a 30 in. gage track system. The drills are mounted on an aluminum guide shell for 6 ft steel changes. Booms can be raised or lowered and the drills swung horizontally and vertically. The jumbo has an upper cantilevered level where three of the six drill mounts are located. The other drill mounts are under this platform.

MacLean-Grove Brewster has a similar jumbo manufactured by Ingersoll-Rand Co. The 8 in. drill is set in a rigid housing, since it has to make only one burn hole and doesn't have to be manoeuvered about.

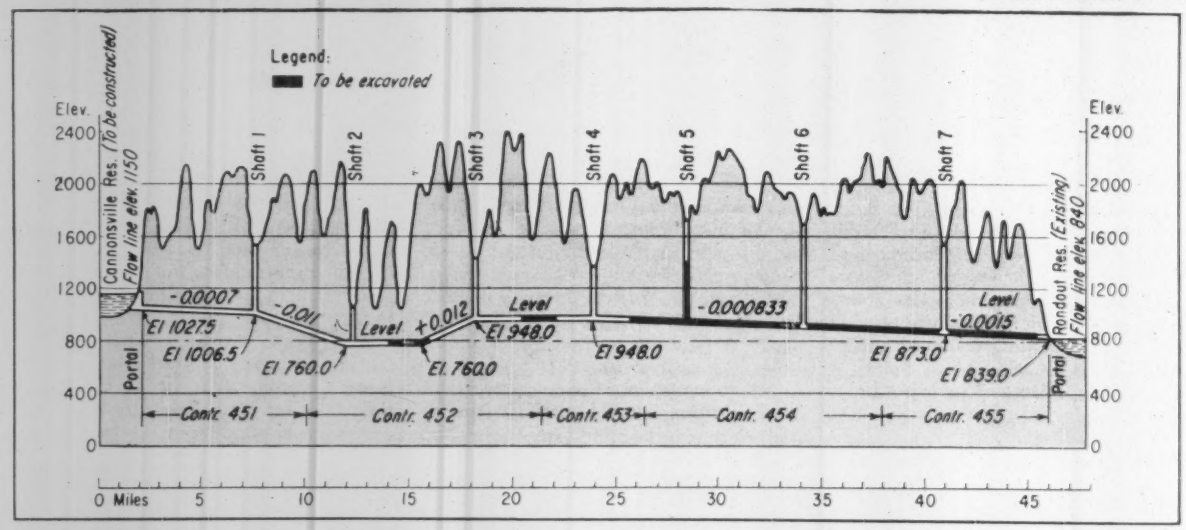
A three-man crew works from the top deck of the jumbo, slightly behind the heading drillers. The crew drills in the tunnel roof for wedge type roof bolts to secure the overhead area. The steel bolts, 1 in. dia, 6 ft long, hold steel plate straps to support the roof, and prevent the falling of loose stones.

• **Blasting**—DGWTC uses short period delayed action electric blasting caps (0 to 9), which are detonated from a transformer section 1,700 ft from the heading. MGB uses Atlas regular delay caps (0 to 8).

After the blast, DGWTC uses an air-powered mucking machine with a ¾ cu yd bucket. MGB uses an electrically powered mucking machine with ¾ cu yd bucket. The mucker loads broken rock



ATOP JUMBO, Drake-Grafe-Winston-Tecon-Conduit miners drill blast holes in face with hydraulically powered drifters.
Hercules Powder Co Photo



44 MILE West Delaware Tunnel is being driven through shale and sandstone for New York City's water supply.

onto a conveyor, to side dumping steel cars. From 16 to 20 cars are loaded and hauled to the base of the shaft where the cars are dumped pneumatically into an 11 cu yd skip directly under the cage. From the skip bucket which rises a maximum of 350 fpm, the muck is placed into a hopper on the tall head farmes alongside the shaft openings.

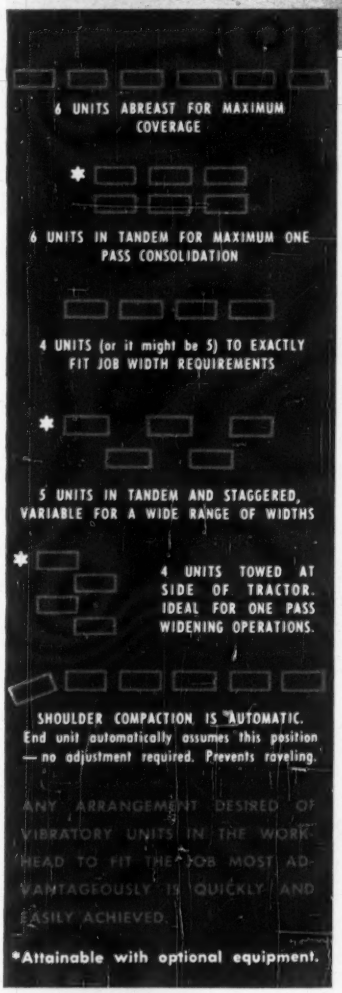
• **Concrete lining**—Following the excavation and cleaning up is the concreting equipment, which lines the tunnel to a finished 11 ft 4 in dia. DGWTC prepares its concrete in a batching plant set up near Shaft No. 1. The heavy cement ratio mix (2 bbl per yd) is dropped down a 10 in. dia pipe, which at some shafts is more than 500 ft long, and is cushioned in a sloping-bottom receiving tank. From here concrete is discharged into a train of 4 cu yd agitator cars.

Invert and curb concrete is placed from the agitator cars. Concrete for the arch is hauled in the agitator cars to a Press-well gun from which it is shot by air through a 6 in. steel pipe into the forms.

MGB is purchasing ready-mixed concrete delivered in 4 cu yd batches. Placing equipment is similar to that of DGWTC.

To date, nearly 70,000 lin ft of curbing and about 55,000 lin ft of invert have been placed in the sections from the inlet to east of Shaft No. 2. Concrete for about 35,000 lin ft of arch has been placed in the tunnel in the section between the inlet and Shaft 2. Some curbing also has been placed in the tunnel area of Shaft No. 4.

• **Other highlights**—An early feature of the West Delaware job was a new shaft


6 UNITS ABREAST FOR MAXIMUM COVERAGE
6 UNITS IN TANDEM FOR MAXIMUM ONE PASS CONSOLIDATION
4 UNITS (or it might be 5) TO EXACTLY FIT JOB WIDTH REQUIREMENTS
5 UNITS IN TANDEM AND STAGGERED, VARIABLE FOR A WIDE RANGE OF WIDTHS
4 UNITS TOWED AT SIDE OF TRACTOR. IDEAL FOR ONE PASS WIDENING OPERATIONS.
SHOULDER COMPACTION IS AUTOMATIC. End unit automatically assumes this position — no adjustment required. Prevents raveling.
ANY ARRANGEMENT DESIRED OF VIBRATORY UNITS IN THE WORK-HEAD TO FIT THE JOB MOST ADVANTAGEOUSLY IS QUICKLY AND EASILY ACHIEVED.
*Attainable with optional equipment.

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A combination which accounts for the fact that more of these machines have been used on major paving projects than all other pan type compactors combined . . . and their popularity continues to increase. Tremendously powerful vibratory action provides 100% of specified density of any material normally used in macadam base or sub-base courses in the shortest possible time. Each unit in the workhead supplies 4200 THREE-TON BLOWS PER MINUTE. And they are FAR MORE VERSATILE THAN ANY OTHER COMPACTOR, ideally adjustable to each and every job requirement. Coverage is what you want it to be, up to 13′, 3″. Any arrangement of the compactor units, as indicated, is quickly attainable. With this machine you can compact areas others can't touch, a factor that eliminates lost motion and saves a great deal of time and money. And, of course, it is equally effective on all types of granular soil fills and similar projects. By all means inspect it at your Jackson distributor.

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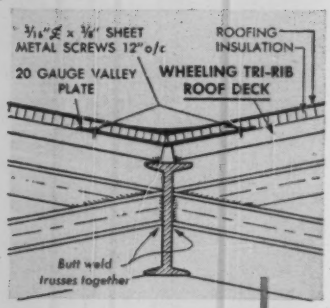
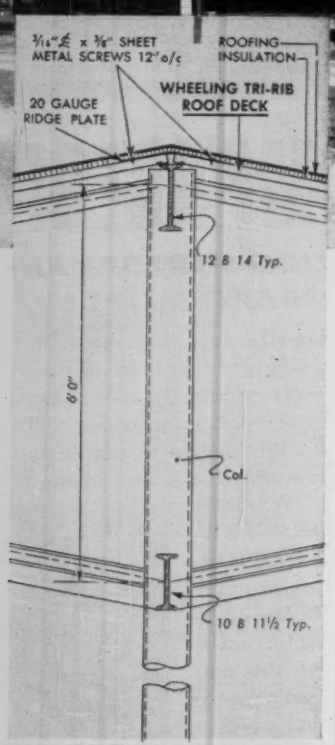
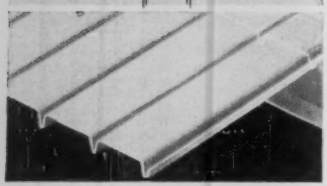

3/16"℄ x 3/8" SHEET METAL SCREWS 12" o/c
ROOFING INSULATION
20 GAUGE VALLEY PLATE
WHEELING TRI-RIB ROOF DECK
Butt weld trusses together

Hechinger customers can forget about the weather! Roof, made of Tri-Rib Roof Deck, extends out 15 feet over walks on all sides to serve as an all-weather canopy.





Wheeling Tri-Rib Roof Deck is designed in accordance with specifications adopted by A.I.S.I. Light Gauge Cold-Formed Steel Design Manual, 1956 Edition.

Featuring a roof using a series of rhomboid-shaped umbrella trusses joined together and constructed of Wheeling Tri-Rib Roof Deck, the Hechinger Company's Rockville, Md., store is one of the world's most modern building supply centers.

Ideal for many types of construction, Tri-Rib is made of Wheeling Cop-R-Loy® steel – the famous copper-bearing steel that has proved its long-lasting qualities through years of actual field use! And – because Tri-Rib is light and strong – it requires fewer and lighter columns, shallower footings and eliminates the subpurlins required by many other types of roof construction.

On the installation shown above, Mr. Frank Wolfsheimer, president of Hechinger Engineering Corp., builders of the center, reports, "We were very pleased with the way Tri-Rib went on, especially with the speed of installation and the way Tri-Rib and Tri-Rib Accessories are engineered to work so perfectly together."

Find out how Wheeling Tri-Rib Roof Deck can help you, too. See Sweets, or contact our nearest representative. Wheeling Corrugating Company, Wheeling, West Virginia.

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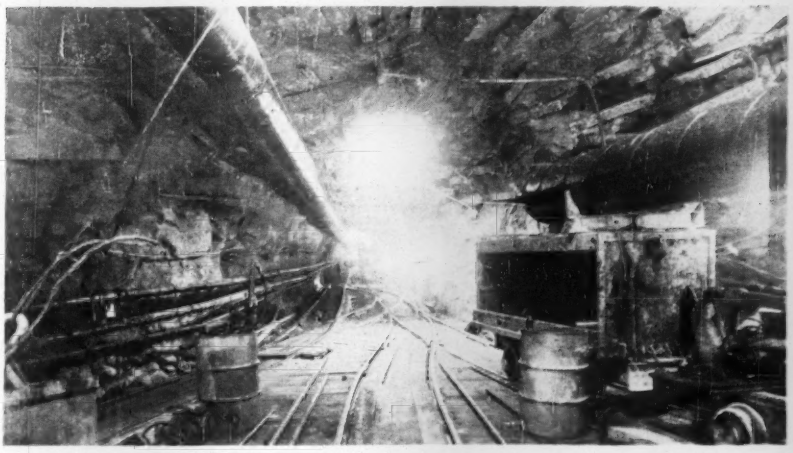
. . . Contractor lays claim to world tunneling record



ENLARGED SECTION of tunnel near shaft permits muck car switching. Large overhead pipes are for ventilation, while smaller pipes on wall supply water and compressed air.

mucker introduced by the Drake operators. Instead of hand or air operated clamshells, they used a grapple consisting of six orange-peel tines that are opened and closed by a central air cylinder. This timesaving unit is made by Joy Manufacturing Co.

The MacLean-Grove Brewster site around Shaft 4 presents a somewhat unusual sight to the visitor. Hardly a window can be found in the contractor buildings. MGB used transluscent plastic panels in the roofs of the buildings to eliminate a comon eyesore, broken windows.

Contractor Scoreboard

	MacLean-Grove Brewster	Drake-Grafe-Winston-Tecon-Conduit
Area (sq ft)	146	136
Burn hole (in. dia)	8	5 (Two)
Number of holes (1¾" dia)	47	50
Number of drillers	7	6
Powder Used (lb cu yd rock)	6.5	6
Average Advance (ft)	11	11
Average Advance (ft per day/heading)	65	65
Muck (cu yd/round)	69	55
Powder	Atlas Gelodyn 2x	DuPont Gelex No. 2 Atlas Gelodyn No. 2 Hercules Gelamite No. 2
Caps	Atlas Regular Delay	Electric with straight delays
Drill	8 in. modified DHD-400 "down the hole" drill—by Ingersoll Rand Co.	5 in. Gardner-Denver 143

Care also has to be taken by the West Delaware contractors not to cause stream pollution. The Board of Water Supply specified that temporary sewage treatment plants—a septic tank, dosing tank, filter bed, chlorinator house and settling tank—be built at shafts where there is danger of polluting a watercourse.

• **Contracts**—The DGWTC group holding contracts 451 and 452 is composed of Johnson Drake & Piper Corp.; Grafe-Callahan Construction Co.; Tecon Corp.; Winston Bros. Co., and Conduit & Foundation Corp. The two contracts total $35.7 million. The same group, less Grafe-Callahan, called itself West Delaware Contractors and won contract 454 for $26.3 million and contract 455 for $19.2 million. Contract 453, for $11.8 million, is held by a joint venture of MacLean-Grove Co. and George M. Brewster & Son.

Payment for work performed under all contracts will be made on the basis of per lin ft of excavation and concrete lining combined, rather than the more common per cu yd prices.

New York City Board of Water Supply's chief engineer is Stanley M. Dore. Deputy chief engineer, with engineering supervision of construction contracts, is N. LeRoy Hammond. BWS forces designed the project. Arthur C. Ford is president of BWS, succeeding the late Irving V. A. Huie.

Representing the Drake-Grafe-Winston-Tecon-Conduit group are Clancy O'Dell, project manager; R. P. King, chief engineer, and John Hester, general superintendent. For MacLean-Grove Brewster, M. L. MacLean is project manager; Guy Simoni, who succeeded Arthur Chase, as project engineer, and Eugene Tufts, general superintendent.

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★ Heavy Turbine Housings
★ Fan and Blower Housings
★ Dust Collector Housings
★ Industrial Gas Mains
★ Expansion Joints
★ Hoppers and Bunkers
★ Tanks and Vats
★ Pressure Vessels
★ Wind Tunnels
★ Crane Bridge Girders
★ Trolley Frames and Trucks
★ Rigid Frames
★ Roll-Over Fixtures
★ Tank Turrets
★ Gun Mounts
★ Heavy Truck Bodies
★ Engine Frames and Bases
★ Crawler Frames
★ Press Platens and Beds
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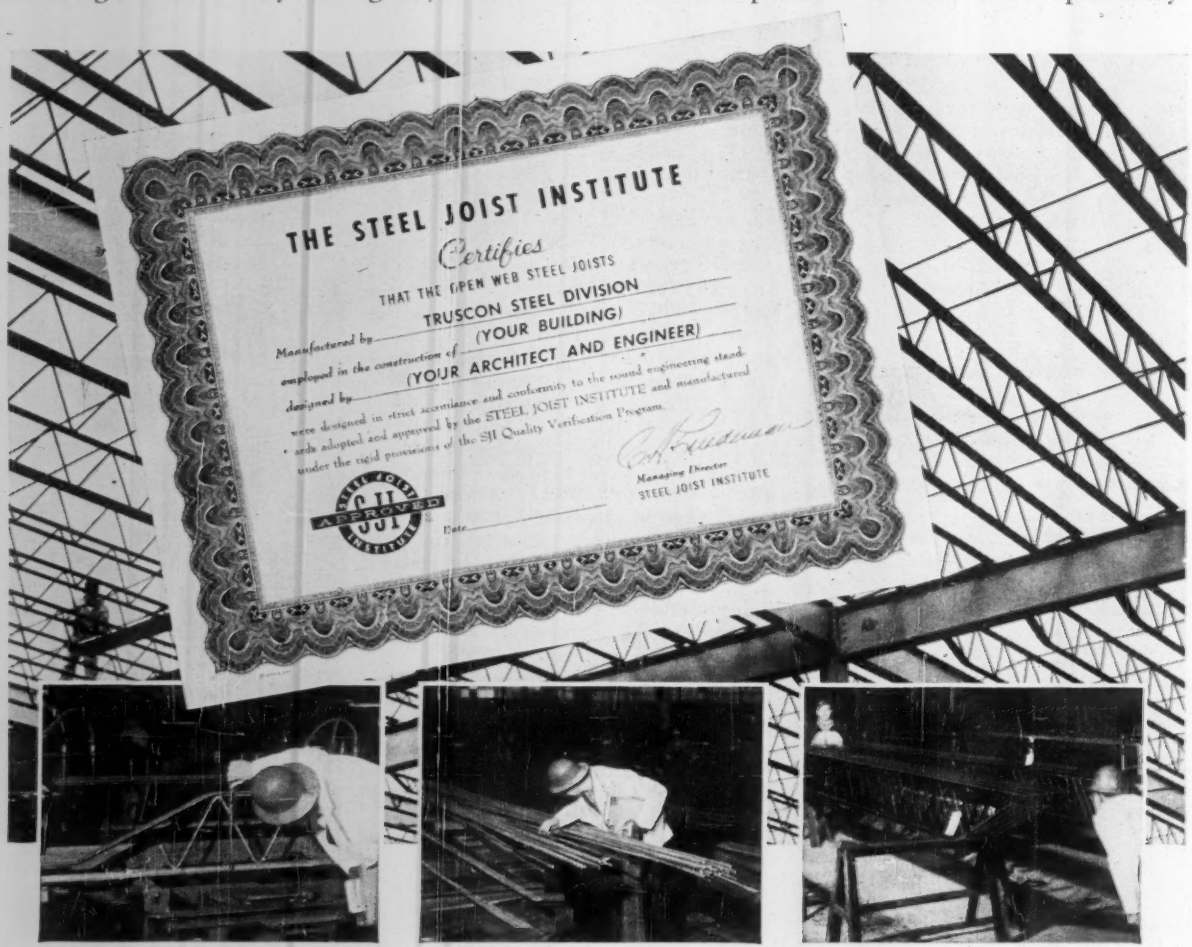
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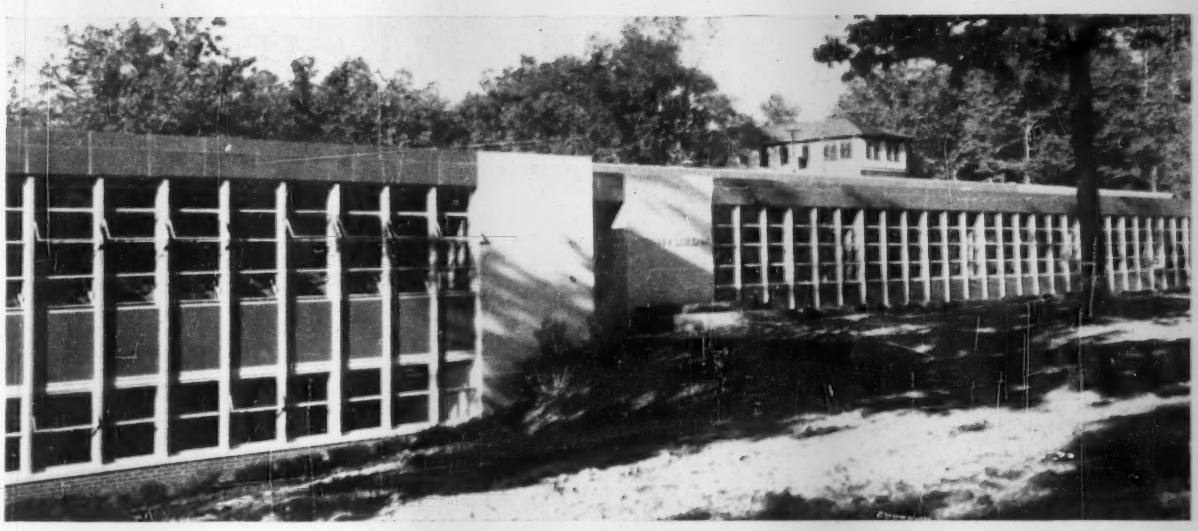
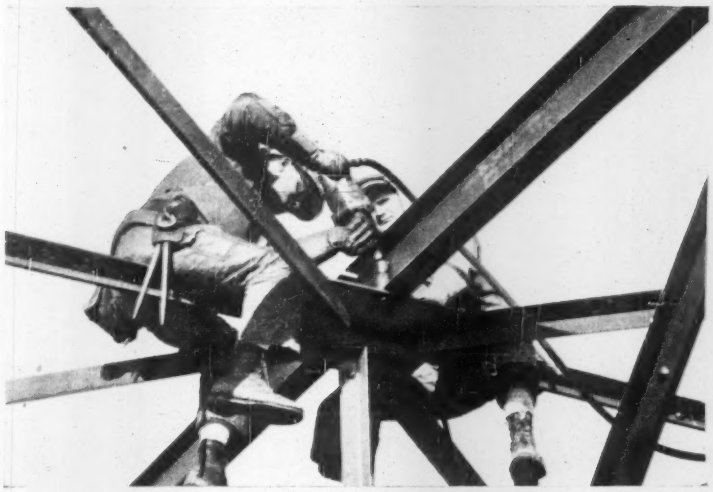


TRUSCON VISION-VENT INSTALLATIONS such as this now can be specified with exclusive new Truscon Super-Coat Finish to eliminate field painting. Pictured is Activities Building, Georgia Training School for Girls, Adamsville, Ga. John J. Barte, Architect. Abco Builders, Contractor.



TWO MAN CREW SAVES TIME AND MONEY using Republic High Strength Bolts for structural joints in Caterpillar Tractor Company's new Industrial Engine Plant at Mossville, Illinois. Only an air-driven torque wrench and a holding wrench were required. As shown, final tightening was done with the torque wrench alone. Installed bolt costs were about 31¢ per unit as compared with twice the amount for field-driven rivets.

REPUBLIC ENDURO® STAINLESS STEEL was used for elevator doors, moldings, and fluted wall panels in the lobby area of the American Hardware Mutual Insurance Building, Minneapolis, Minnesota. The softly finished ENDURO added to the beauty of marble floors and walls.

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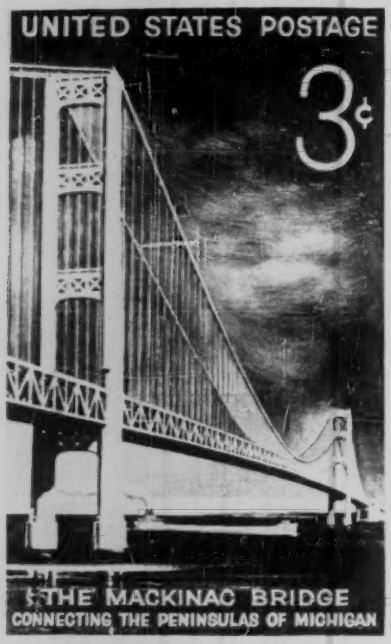
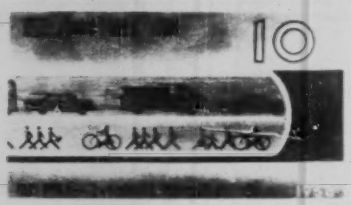
Small-Scale Honor for

Yesterday, June 25, the U. S. Post Office issued a stamp to announce the dedication of recently opened Mackinac Bridge (left).

This is believed to be the first time that the dedication of an engineering or construction feat has been specifically commemorated by the U. S. But it is a well-established American and foreign practice to depict on postage stamps exceptional civil engineering accomplishments. The first such U. S. stamp appears to be a two dollar one, issued June 10, 1898, showing the Mississippi River Bridge at St. Louis.

Whatever other differences nations may have, they all join in advertising to the world by means of stamps their dams, buildings, highways and tunnels. Here are some from the collection of ENGINEERING NEWS-RECORD correspondent James Montagnes, Toronto.





Japan—Kanmon, a 2½-mile long double-level tunnel. *(Issued February, 1958)*

Panama—Construction on the Pan-American Highway. *(Issued in 1957)*

Belgium—Atomium of the Brussels International Exposition. *(Issued Spring, 1958)*

Algeria—Recent stamp for a new railway bridge. *(1957)*

Russia—Highway, the Moscow-Volga Canal and a railway bridge all meet. *(1941)*

Venezuela—The Caracas-La Guaira Expressway. *(Late 1957)*

Czechoslovakia—Current building construction methods. *(Late 1957)*

Germany—A mountain highway cut through rock. *(1936)*

Saar—Bridge under construction on the French-German border. *(1955)*

Big Jobs

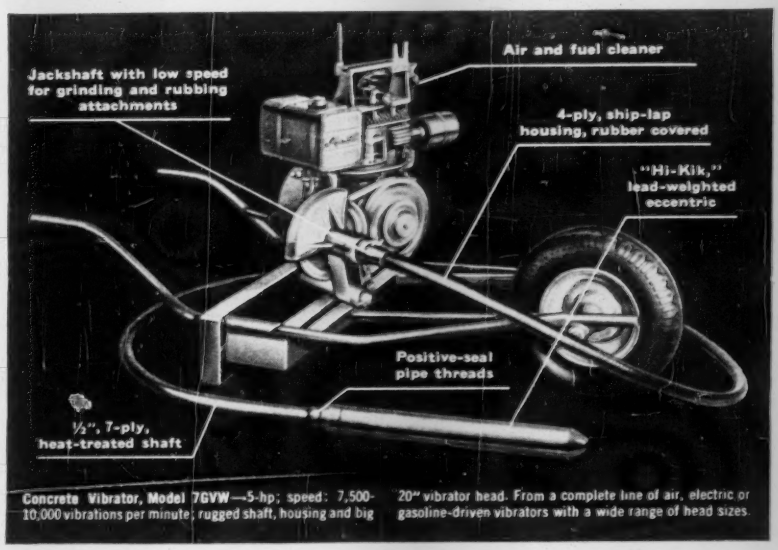
U. S.—The American pavilion on the Brussels fair. *(June 1, 1958)*

Madagascar—High span of the Antsirabe Bridge. *(1957)*

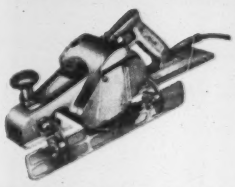
Russia—Dnieprostroy Dam and power station. *(1947)*

Germany—New exhibition hall in Berlin. *(April, 1958)*

POWER to boost job efficiency with REMINGTON tools

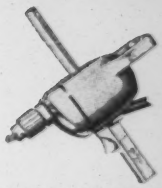

Jackshaft with low speed for grinding and rubbing attachments
Air and fuel cleaner
4-ply, ship-lap housing, rubber covered
"Hi-Kik," lead-weighted eccentric
Positive-seal pipe threads
½", 7-ply, heat-treated shaft

Concrete Vibrator, Model 7GVW—5-hp; speed: 7,500-10,000 vibrations per minute; rugged shaft, housing and big 20" vibrator head. From a complete line of air, electric or gasoline-driven vibrators with a wide range of head sizes.



Planer, Model 3P—Sealed transmission and bearings; 3" width; depth adjustable, 0-⅛"; full-grip rear handle with trigger switch; 8.4 amp, AC/DC motor. Speed: 13,500 rpm.

Pneumatic Chain Saw, Model 2P—Heavy-duty; 18", 24" or 30" bar; roller bearing nose for fast cutting, longer bar life; automatic motor oiler; trigger throttle in hand grip.



Electric Drill, Model 125—½" capacity; geared key-type chuck; 5-amp motor; removable auxiliary handle; ball and needle bearings; weight: 8½ lbs.; free speed 500 rpm.

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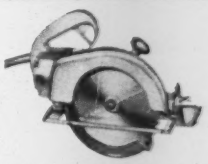
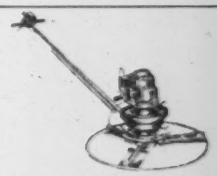


Electric Saw, Model 108—10" blade; 13-amp motor with powerful worm drive; cuts full 3⅜"; complete with combination blade, wrench and steel carrying case.



Power Trowel, Model TG4-36—2¼-hp, 4-cycle, gasoline-powered engine; 36" ring size; automatic-recoil starter; centrifugal clutch disengages at idle; safety throttle control.

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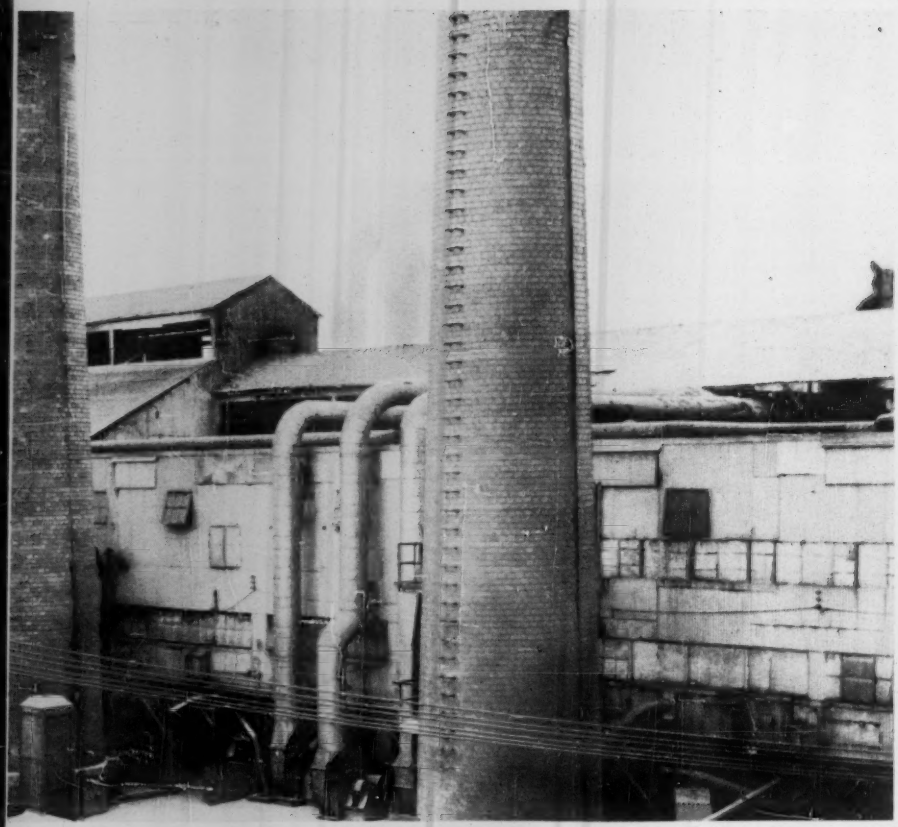
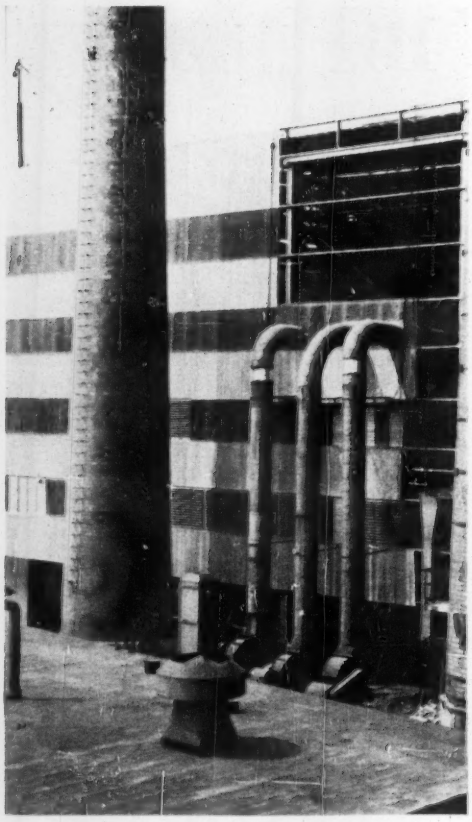


OLD PLANT was inadequate. Despite furnace heat inside . . .



REPLACEMENT was built with

Run-Down Factory Gets New Shell

Without loss of a single day's production, a new building was built around an Owens-Corning Fiberglas Corp. plant in Newark, Ohio, and then the old structure was removed.

The project was further complicated because it was necessary to work directly over glass-melting furnaces and keep the existing building weathertight throughout construction.

Production continued without interruption, 24 hours a day, seven days a week in the old building. It houses four of the largest furnaces in the world for melting glass for glass-fiber production. These are operated at temperatures of about 2,700 F. As a result, construction was carried out under potentially hazardous conditions and frequently at temperatures reaching 170 F. It also was necessary to rebuild a glass furnace during construction.

• **A matter of economics**—The old building, which dates back to 1918, was 194x270 ft, with clear heights varying from 32 ft in the part housing the glass furnaces down to 7 ft in part of the manufacturing area.

It became apparent in 1954 that the structure was inadequate. Ford, Bacon & Davis, Inc., consulting engineers, New York City, were engaged to determine whether the building should be replaced or the production operation located elsewhere.

A survey indicated that the most economical solution was to replace the existing building, if it could be done without loss of production. Building elsewhere would have required construction of additional supporting facilities, such as batch, steam, air, and binder operations.

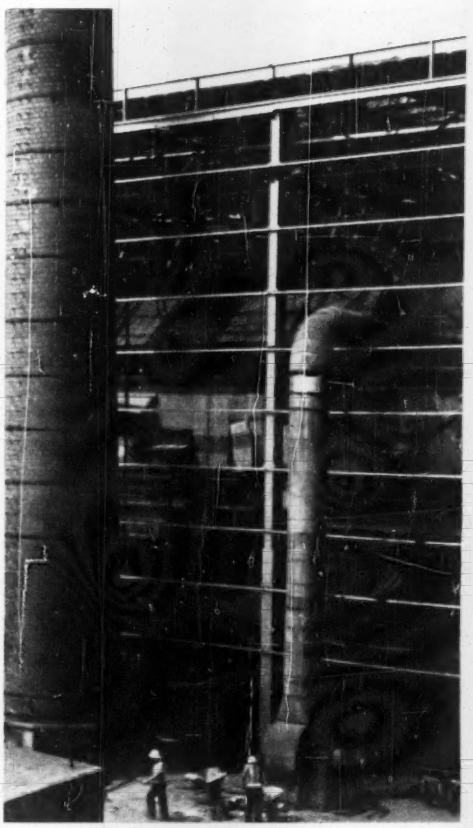
• **Avoiding interferences**—To meet the owner's need, a new building 200x276 ft was designed. Its roof has two levels. One, over a low bay above the manufacturing area, provides a clear height of 33 ft. The other, over a high bay above the furnaces, gives a clear height of 59 ft.

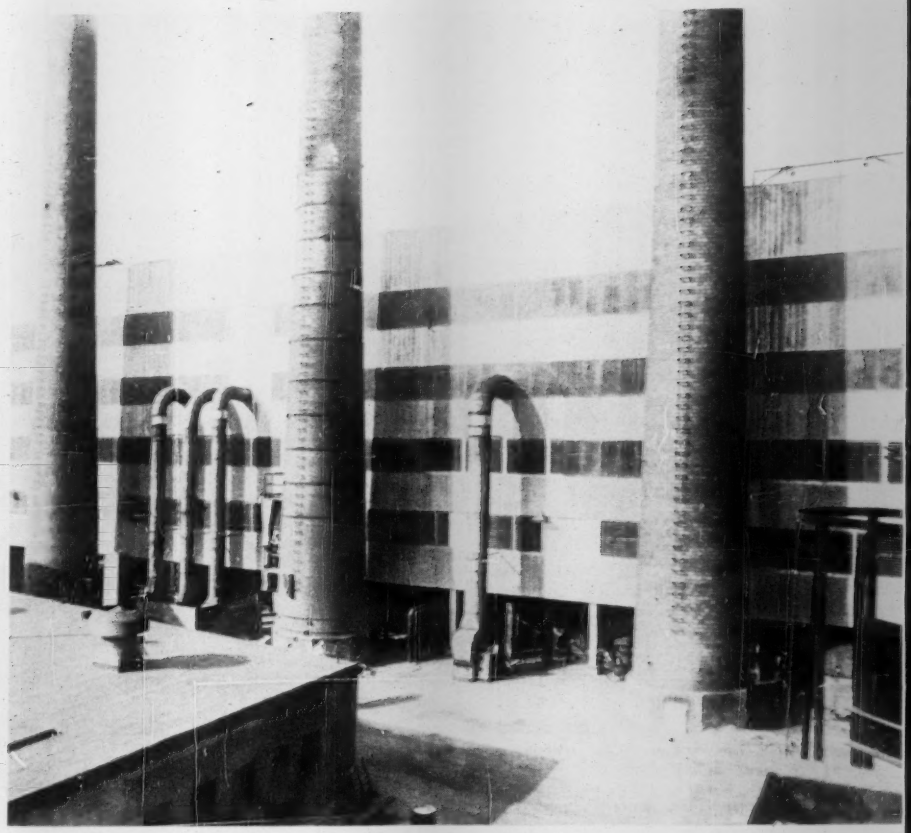
Location of columns within the building required detailed analysis, so there would be no interference with existing and realigned production operations. It was found that the columns could not be in line. Long-span trusses were used extensively. The main trusses span 112 ft, weigh up to 14 tons.

Soil analyses were made for all footings, since the plant is located in an area that was formerly a river bottom. Due to poor soil conditions, footings had to be as deep as 25 ft below grade. Sheetpiling for excavations, in many instances, was welded solid to retain sandy and clayey silt that resembled quicksand.

In addition, extreme care was necessary so that the octagonal bases of the four 135 ft high brick-radial furnace stacks would not be disturbed.

While footing work was done, service lines and auxiliary equipment were relocated to clear the area for the columns. Thirteen underground utility pipe lines were uncovered in one 6 ft square area. It was necessary to drill and test each line to determine whether





no halt in production by . . . . . NEW BUILDING surrounding the old one.

Without Slowing Output

it was active—five were found in use.

Because of the limited space around the new building, part of the low-bay area was constructed so it could serve as a working platform for the remainder of the structure.

Steel was transported to the job site by truck, then hoisted from the trucks to the working platform by a mobile crane. From there, the steel was handled by a 5 ton whirling crane. As it set the steel progressively across the low-bay roof, the crane traveled on rails mounted on the trusses it had previously erected.

For the high-bay structural steel a 60 ton crane was used, with a 150 ft boom to handle the main trusses.

Due to confined quarters and the weight of trusses, it was impossible to erect them in one piece. Therefore, one-quarter of each truss was erected and held in place by temporary bracing. The rest was erected as a unit.

• **Safety a prime objective**—Demolition of the old structure required careful planning. It was the most difficult phase of the project. It meant working directly over the glass melting furnaces and production machines.

Temporary overhead protection was constructed to safeguard personnel and equipment on the production lines. Great care was exercised to prevent equipment or tools from falling. And shelters were built to protect demolition men from the intense heat. These measures paid off; there were no serious injuries.

The old building had to be cut into small pieces, which were manually removed because of the confined space.

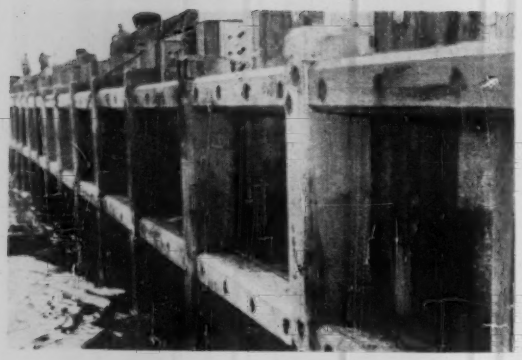
Before this could be done, however, the large number of utility service lines in the old building, which hung on the existing steel, had to be relocated or resupported. So trusses were erected to carry a suspended 20 ft wide pipe bridge over the production machines.

The bridge extends the width of the building and carries all service mains, including air, steam and gas; industrial, domestic and treated water, and numerous process pipelines. A walkway was established down the center of the bridge to permit easy access for maintenance.

A new 6 ton elevator was installed to facilitate moving of refractories and process equipment to the main furnace and batch floors. Formerly, all such materials were moved up steel ramps with hand trucks and powered cables.

Working conditions have been vastly improved by construction of the new building. Extensive use of glass-fiber reinforced plastic panels in exterior walls permits more natural light to enter the interior. A greater number of fans improves ventilation, and the higher ceiling increases the efficiency of the artificial lighting. A number of water and steam pipes, formerly located on the roof, now are housed within the building.

George A. Fuller Co. was the general contractor, with Wendell Power as field superintendent. For Owens-Corning, H. O. Youngquist was the major project engineer and R. C. Helle was project manager.



What Woods Make Good

Here's what you need to know before selecting wood for marine structures

This report is based on the author's four years experience with the patented retractable fender system used at Brooklyn Navy Yard, and 20 years experience on construction projects throughout the world.

How Hardwood Qualities Compare. A Check List for Easy Reference

REGION	NAME	BENDING STRENGTH	HARDNESS	SHOCK RESISTANCE	SPECIFIC GRAVITY	DURABILITY	MARINE BORER RESISTANCE	AVAILABILITY
No. America	White Oak	Fair	Fair	Good	.68	Must be creosoted	Good treated	Abundant
No. America	Red Oak	Fair	Fair	Good	.68	Must be creosoted	Good treated	Abundant
No. America	Black Gum	Fair	Fair	Fair	.50	Must be creosoted	Good treated	Abundant
No. America	Red Gum	Fair	Fair	Fair	.50	Must be creosoted	Good treated	Abundant
British Guiana	Greenheart	Very strong	Very hard	Good	.93	Excellent	Excellent	Abundant
French Guiana	Angelique	Strong	Hard	Good	.72	Good	Fair	Fair
Brazil	Piquia	Strong	Hard	Good	.88	Good	Fair	?
British Guiana	Maristribaili	Very strong	Very hard	Good	1.09	Excellent	Excellent	?
So. America	Acapu	Strong	Hard	Good	.95	Good	Good	Fair
British Guiana	Black Kakerali	Strong	Very hard	Good	1.00	Excellent	Excellent	?
Western Pacific Reg.	Atoeng	Strong	Hard	Good	.83	Good	Good	Fair
Western Pacific Reg.	Ipil	Very strong	Very hard	Good	.78	Good	Good	Limited
Western Pacific Reg.	Kasi-Kasi	Fair	Hard	Good	.61	Good	Very good	Fair
Western Pacific Reg.	Dungon-late	Strong	Hard	Good	1.01	Good	Very good	Fair
Western Pacific Reg.	Pagatpat	Strong	Hard	Good	1.03	Good	Good	Fair
Western Pacific Reg.	Tongong	Strong	Hard	Good	.99	Good	Good	Fair
Western Pacific Reg.	Bogoia	Strong	Hard	Good	1.14	Good	Very good	Plentiful
Phil. Islands	Anubing	Fair	Moderate	Good	.75	Good	Very good	Fair
Phil. Islands	Alupag	Strong	Hard	Fair	.97	Very good	Good	Limited
Phil. Islands	Apitong	Strong	Hard	Good	.80	Creosoting recommended		Plentiful
Phil. Islands	Bansalagin	Strong	Very hard	Good	1.06	Good	Fair	Fair
Phil. Islands	Kalamansanai	Strong	Very hard	Good	.93	Fair	Fair	Fair
Phil. Islands and N. Guinea	Narig	Very strong	Very hard	Good	.97	Good	Very good	Fair
New Britain and New Guiana	Komo Kamarere	Strong	Hard	Good	.83	Good	Fair	Fair
New Britain and Bismark	Malasa	Strong	Hard	Good	.97	Good	Good	Fair
New Britain and Moluccas	Zizanu	Good	Hard	Good	.75	Good	Good	Plentiful
So. Papua	Paper-bark	Strong	Very hard	Fair		Good	Good	Abundant
So. China Sea Reg.	Kiet-mouk	Strong	Hard	Good	.97	Good	Fair	Fair
So. China Sea Reg.	Doengon	Strong	Hard	Good	1.01	Good	Fair	Fair
So. China Sea Reg.	Seng Kang Wang	Strong	Very hard	Good	1.04	Very durable	Good	Fair
So. China Sea Reg.	Bakau-belukap	Strong	Hard	Good	.99	Durable	Good	Plentiful
So. China Sea Reg.	Baratlaut	Very strong	Hard	Good	1.11	Very durable	Good	Fair
So. China Sea Reg.	Balam sundik	Strong	Hard	Good	.77	Very durable	Good	Fair
East Indies	Moluccan Ironwood	Strong	Very hard	Good	.77	Good	Fair	Fair
Thailand	Deng	Very strong	Hard	Good	1.10	Good	Good	Plentiful
Thailand	Lumpaw Maca-mong	Very strong	Hard	Good	.77	Good	Good	Plentiful
Thailand	Kleng	Strong	Hard	Good	.90	Good	Good	Fairly plentiful
Thailand	Rang	Strong	Hard	Good	.99	Good	Good	Plentiful
Thailand and Burma	Teng	Strong	Hard	Good	1.04	Good	Good	Plentiful
Melayas and Burma	Kajoe batoe	Strong	Hard	Good	.98	Durable	Good	Fair
Burma	Pyinkado	Strong	Hard	Good	.95	Very durable	Good	Abundant
Borneo	Lizerhout	Very strong	Very hard	Good	1.03	Very durable	Good	Fair
Nepal	Sal	Strong	Very hard	Good	.90	Durable	Good	Fair
Nepal	Sandan	Strong	Hard	Good	.89	Durable	Fair	Fair
Nepal	Dhaura	Strong	Hard	Good	.92	Durable	Fair	Fair
E. Pakistan	Chaplash	Fair	Fair	Good	.65	Durable	Very good	Fair
E. Pakistan	Nageswar	Very strong	Very hard	Good	1.02	Very durable	Good	Fair
West Africa	Ekki	Very strong	Very hard	Good	.97	Very durable	Very good	Plentiful
West Africa	KoKrodua	Strong	Hard	Good	.70	Very durable	Good	Plentiful
Australia	Jarrah	Strong	Hard	Good	.80	Very durable	Good	Plentiful
Australia	Ironbark	Very strong	Very hard	Good	1.10	Very durable	Good	Plentiful

Pier Fenders?

Palmer W. Roberts
Captain, CEC, USN
Public Works Officer, U. S. Naval Shipyard
New York, N. Y.

Wood for waterfront construction—particularly for wood fendering systems—should be heavy, dense, hard, durable, should have high unit bending stresses and should resist fungus and marine borer attacks. These conclusions have been reached after four years of experience with retractable fenders at the New York Naval Shipyard, where red oak, white oak, angelique and other hardwoods were tested.

While experience showed these qualities to be most important for the retractable fender system in particular, the remarks may be extended to cover nearly all kinds of wood fender systems. In the case of the gravity systems, weight is more important than in other marine uses. And with most uses in waterfront construction, high fiber bending stresses are needed whenever the wood is subjected to forces that tend to bend the timber.

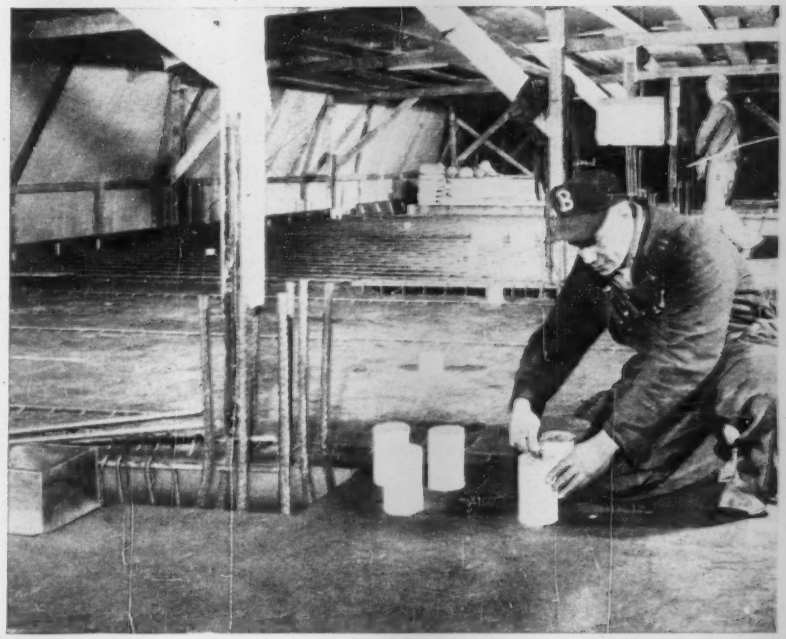
Selecting woods for waterfront use is often difficult. You'll find it helpful knowing what woods are available at most economical costs.

Since the timber must resist the crushing action of the ship, high compressive strength perpendicular to the grain is most important. Also, the vessels' rubbing against the wood makes high fiber hardness an important consideration as well. Yet this hardness must exist without brittleness if checking is to be avoided. Finally, since much impact energy of many fender systems is taken up through bending, the fiber bending stresses should be high as well.

Even if the wood measures up to all the hardness and strength criteria, care should be taken to see that the wood will resist marine borers. If hardwood able to resist teredos and limnora cannot be obtained at reasonable cost, then a pressure-treated creosoted soft wood is suggested. In a gravity system where greater impact is absorbed by greater weight, then creosoting adds to the advantage by making the wood heavier.

The results presented in the accompanying table represent a compilation of data from some 20 years of experience working with woods at marine installations in various parts of the world. Continued study is being made by both the Forest Products Laboratory of Madison, Wis., and the Foreing Shipbuilding Woods Task Committee of the National Security Industrial Association on the characteristics and availability of various woods.

MASONITE
Makes the News



Mt. Airy Homes, St. Paul, Minnesota *Architect:* Walter Butler Co., St. Paul
General Contractor: Lovering and Sweitzer, St. Paul

Why patch cut-up forms?

Replace with low-cost

MASONITE *Concrete Form* PRESDWOOD

Isn't this a familiar sight? More and more plans now call for duct work, plumbing and conduit to be set in the slab. This means more and more holes cut in the form, fewer reusable forms.

All the more reason, then, to form with panels of Masonite® Concrete Form Presdwood®. Their low original cost means you save on the cost of replacing cut-up panels. Their workability means you save time and money in erecting forms. Then, by using the 4′ x 12′ size panel, you'll have only two-thirds as many joints to grind. And those forms that are left intact can be used time and again.

More and more contractors are pouring against these dense, grainless panels...against the smooth, texture-free side, or the screen side ...and getting clean, architectural concrete. For a free sample and a specification booklet, simply mail the coupon.

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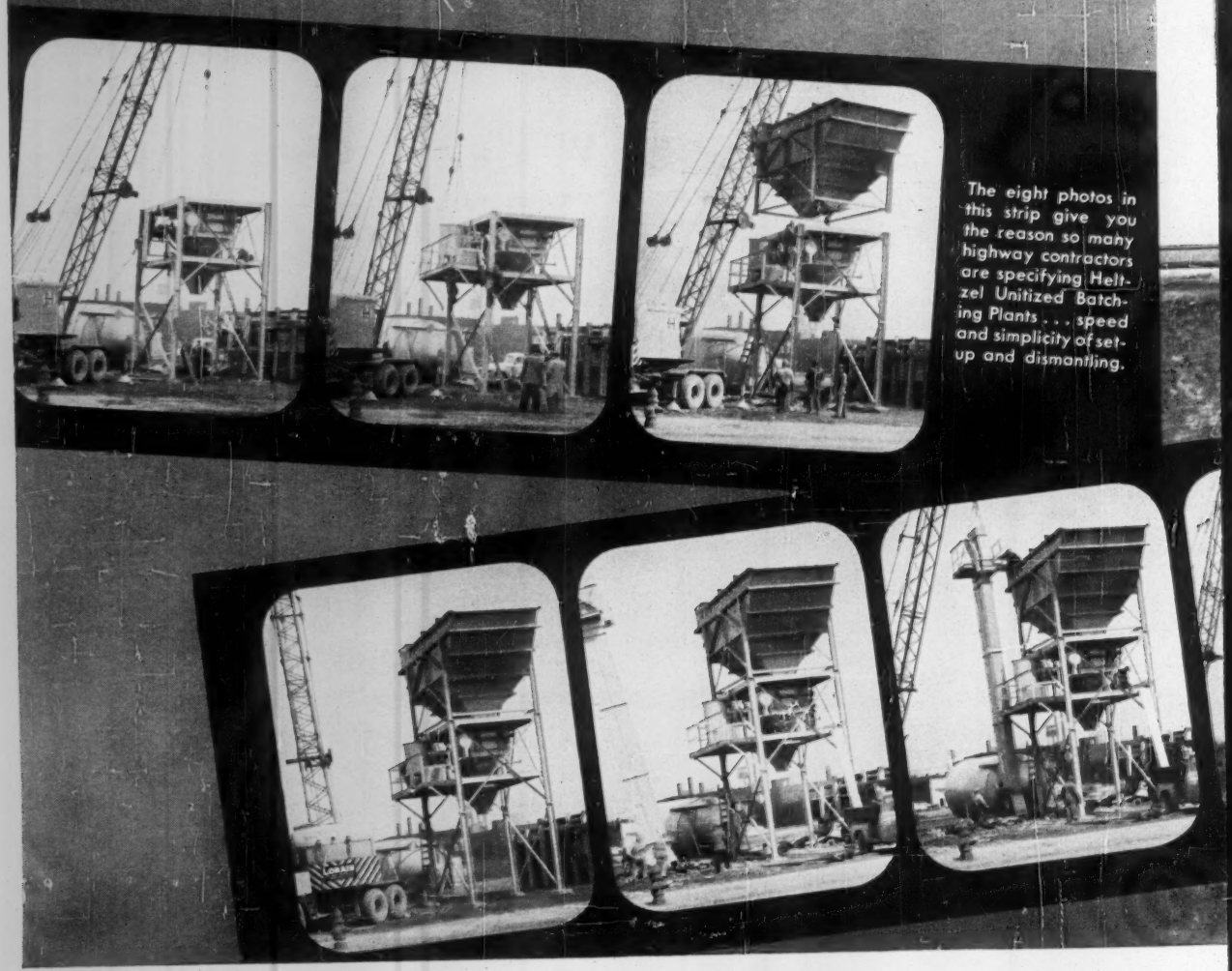
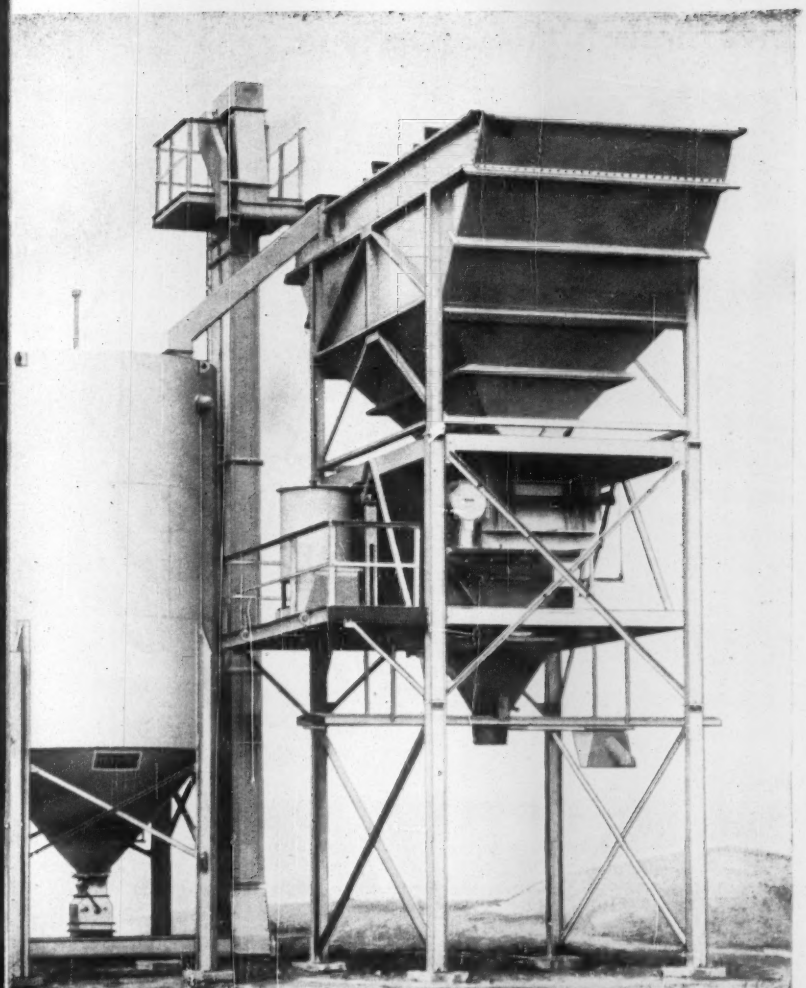
This extra-portable new Heltzel Unitized Batching Plant sets up faster . . . combines dry batch and truck mix

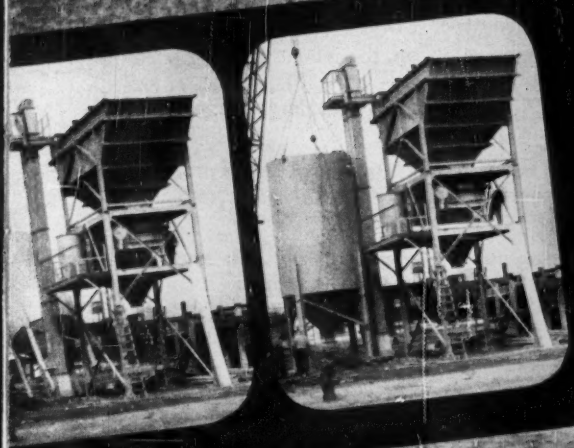


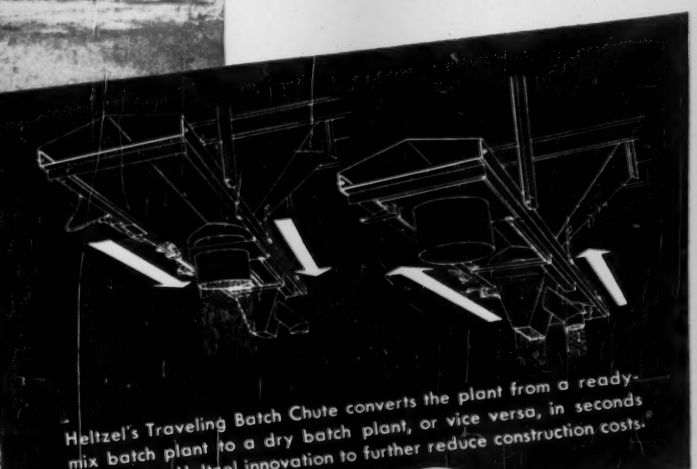
The eight photos in this strip give you the reason so many highway contractors are specifying Heltzel Unitized Batching Plants . . . speed and simplicity of set-up and dismantling.



Heltzel's new Unitized Plant goes together while you watch. It's the ultimate in portable batching equipment! The batching plant is factory assembled in three easy-to-handle sections that require only a minimum crew and standard crane equipment to set up. The factory assembled elevator comes as one complete unit that is easily set in place. The one-piece cement bin completes the basic assembly. For the first time an entire plant—batching section, storage and elevator sections—has been designed to give highway contractors a completely unitized, one-stop, truck mixer charging plant that is also well suited as a dry batch paving unit.

What's more, this is a Heltzel plant in every way. At no point in its design or construction did the engineers sacrifice Heltzel quality. In fact, because scales, batchers, etc., are factory assembled, it's exactingly accurate and extremely fast—the finest engineered portable batching equipment developed to date. Make sure you have all the information on this time-saving packaged plant before you buy your next unit.





Heltzel's Traveling Batch Chute converts the plant from a ready-mix batch plant to a dry batch plant, or vice versa, in seconds . . . another Heltzel innovation to further reduce construction costs.

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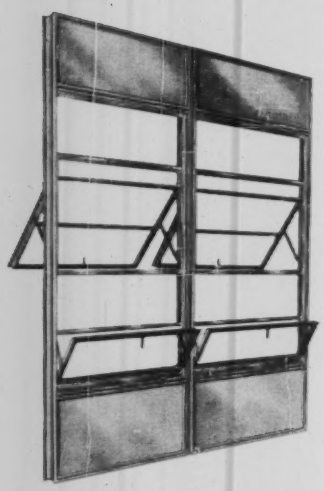

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Checking with Bayley, especially in the planning stages, has saved time, cut costs, and solved problems for architects and engineers for *more than 75 years*. (Bayley curtain-wall experience alone goes back more than 30 years.)

This Bayley leadership is not simply a matter of better products. It includes design co-operation — plus *follow-through* to actual building occupancy.

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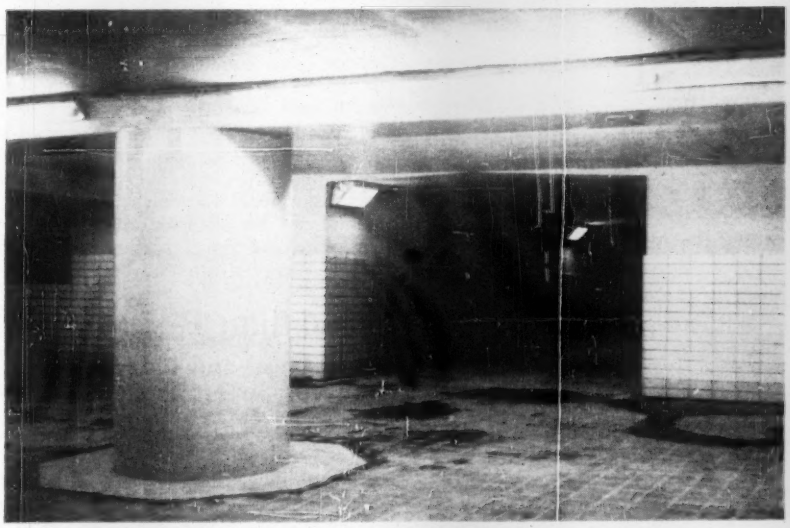
VEHICLES go through upper level of Japan's new tunnel . . .



. . . Pedestrians use lower level of the tunnel.

Japan's Island-Connecting Tunnel Opens

First started 21 years ago Kanmon Tunnel, the world's longest undersea tunnel, was recently opened, connecting the Japanese islands of Honshu and Kyushu. Construction on the 11,421 ft long tunnel began in 1937, was suspended for 10 years during and after World War II, and was completed in March at a total cost of $22 million.

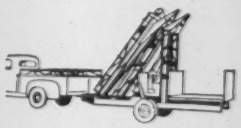
The 36.3 ft dia bore is split into two levels—the upper for vehicles and the lower for pedestrians and bicycles (ENR Sept. 13, 1956, p. 56). About one-fifth of the total length of the tunnel is at a depth of 150 ft below the sea.

Portals are at Shimonoshi on Honshu, main island of Japan, and at Moji on Kyushu, southernmost island of the group. A toll of $2.50 (900 yen) is to be charged for cars and about 3 cents (10 yen) for pedestrians.

• **USSR host**—Architects from the U. S., Britain, France, Western Germany, Bulgaria, Holland and Chile will attend the fifth congress of the International Union of Architects in Moscow this summer.

(*International continued on page 46*)

To help prepare the JUPITER C for its flight into history —the scientists and engineers at Redstone Arsenal chose the BUCK HOISTOWER.



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Fantabulous Pushers

by R. G. LeTOURNEAU

When 200 tons of military airplane crashes on a runway, it can pretty well bring to a halt landings and take-offs until the wreckage is cleared up. And clearing up that much junk is no small job. You've got to have the equipment to do it . . . and do it fast.

Since you aren't going to get things back in operation just by wishing, and manpower alone won't do it, you've got to have a machine. But it takes a lot of machine to shove 200 tons out of the way.

As a matter of fact, we decided it would take 2 machines . . . and we built them. They're big tractors called Crash Pushers. A pair of them can shove a 258 ton jet wherever you want it, which in this case is out of the way.

Each Crash Pusher has six wheels and each wheel stands 10 feet high and is four feet wide. That's a lot of wheel, but this is a lot of tractor.

We were told by an Air Force officer that when his little boy first saw one of these machines, he exclaimed, "Dad, it's fantabulous!" His dad said, "You mean it is fabulous — or maybe you mean fantastic." "No, Dad," the lad answered, "I mean it's both! It's fantabulous!"

Recently we ran a test at an Air Force installation. A B-36 bomber, crippled beyond practical repair, sat on the runway. It had been loaded up with sandbags until it weighed about 200 tons. This was the equivalent of a larger plane that will be cluttering up a runway someday when a whole bunch of planes must take off on a mission, or a bunch of battle-scarred planes are waiting their turn to come down — when time means lives, to say nothing of many millions of dollars worth of planes.

Two of these Fantabulous machines walked up to this 200 tons of crippled airplane and put their snouts, like two great elephants, against the leading edge of the wings — one on each side of the fuselage — and without even a snort the whole plane began to slide and moved off like it was only a chicken coop.

Without any shifting of gears, the 600 horsepower diesel engine will transmit its full power to the machine's electric wheels in infinite ratios from zero to 25 m.p.h. You can bring the speed down to one-tenth of a mile an hour, if you wish, and still have the same torque you had at 2½ m.p.h. or 25 . . . all under perfect control of one little handle on the instrument panel.

The Fantabulous Crash Pushers are just one more example of the big machines we build to solve big problems. You might have some problems that require big solutions . . . if so, why not talk with us? We'd be happy to sit down with you.

R.G. LeTourneau

R-107

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. . . International

New Thames Tunnel

Blackwall duplicate is begun after 20 years wait

After a 20 year delay caused by war and postwar economic conditions, work has begun in East London's dock area on a $25 million project to duplicate 61 year-old Blackwall Tunnel under the Thames River. One effect of the long wait has been a jump in the original estimated cost of the tunnel proper from $8.4 million to $21 million.

Detail design work on the tunnel has not yet started, but it will approximate the 4,470 ft length of the original and will have an external 30 ft dia to contain a 20 ft wide, two-lane roadway.

The existing tunnel, built primarily for horsedrawn vehicles, has a 16 ft roadway and two 3½ ft sidewalks. Traffic which was 911 vehicles a day in 1898 was up to 13,000 a day last year.

Both tunnels will use the same approaches, with the new one to be routed 800 ft to the east of present Blackwall for its underwater section. The current project is planned in two stages. First phase, just begun, is a $1.7 million remodelling job to the approaches at both ends. The tunnel itself is scheduled to get under way in about a year.

One interesting specification for old Blackwall called for lighting—the tunnel was one of London's first roads illuminated by electricity—to be "sufficient to read the TIMES newspaper in any part of the tunnel."

Canadian Roads

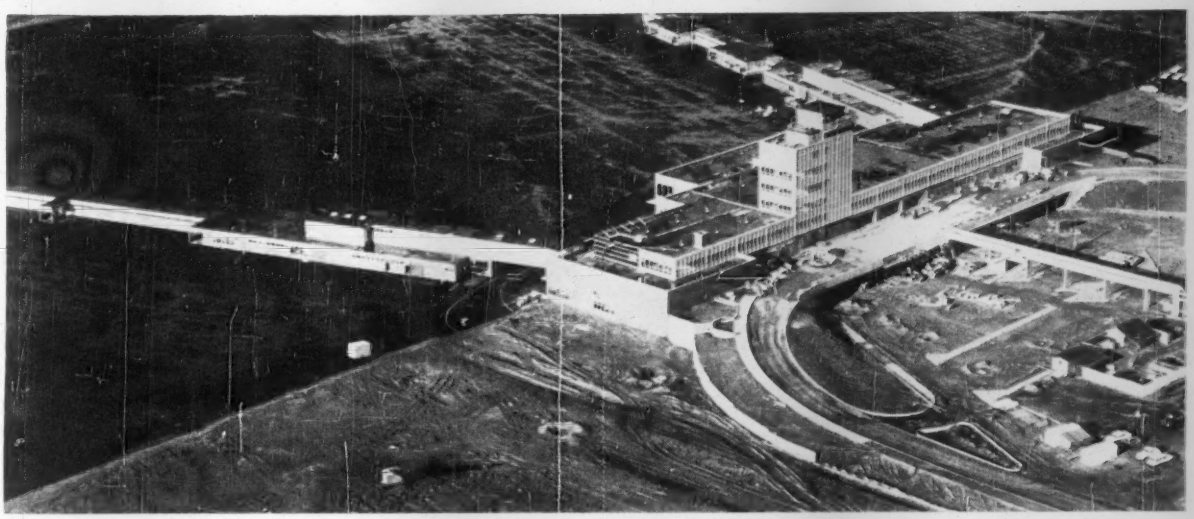
Local and federal are set to spend $900 million

Canadian road expenditures, both local and federal, are expected to reach $900 million for fiscal 1958. This compares with the Canadian Good Roads Association estimate of $861 million spent for road construction and maintenance in fiscal 1957. Provincial road budgets make up about 70% of the total.

Preliminary figures from Ontario are set at $252.8 million, of which $179.6 is for new construction and $73.2 million for maintenance—10% higher than last year. Quebec provincial expenditures are expected to total about $120 million this year.

In the east, Novia Scotia, New Brunswick, Newfoundland and Prince Edward Island are set for well over the $69 million of last year. In the west, Manitoba, Saskatchewan, Alberta and British Columbia, are planning $207 million worth for the year.

Federal government new road money



In final construction stages is this new International Airport Terminal, Portland, Oregon. Parking area is in right foreground, between curving pedestrian ramps built with Armco Retaining Walls.

Armco Retaining Walls Support Ramps
at New Portland International Airport Terminal

When its new International Airport is completed, The Port of Portland, Oregon, will gain important recognition on the world air map. Assigned to a role in the erection of this 8-million-dollar facility are two installations of Armco Bin-Type Retaining Walls at the airport terminal.

These Armco Walls are identical, extending from each side of the terminal in diminishing heights. They contain the outside slope of the fill on the ramp-type pedestrian approaches to the second floor of the terminal.

Each Armco Wall is 190 feet long, curved in a continuous circular radius of 234 feet, with height ranging from 6.67 to 13.33 feet.

It is planned that the new terminal building will be completed this summer.

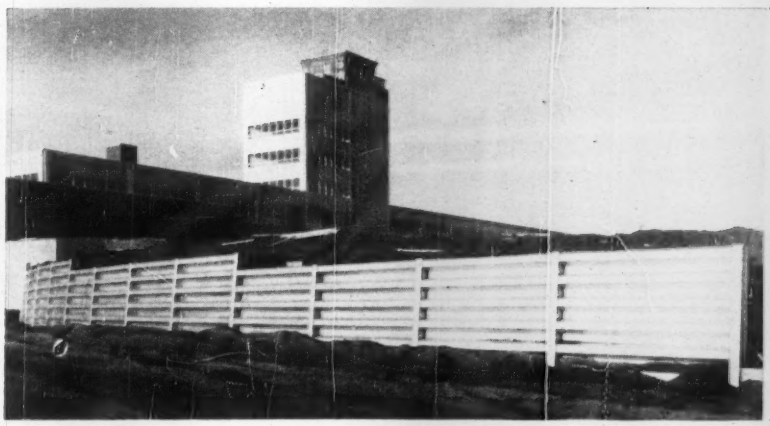
* * * *

Armco Retaining Wall is just one in the group of more than 30 Armco Products for engineering construction. Hundreds of Armco sales engineers are ready to give you quick service and transportation savings from the 56 Armco fabricating plants. For details, write us. Armco Drainage & Metal Products, Inc., 5548 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

Contractor: Ross B. Hammond Co.
Portland, Oregon

Architect: Burns, Bear, McNeil & Schneider
Portland, Oregon

Close-up of Armco Retaining Walls, after assembly and backfilling. Terminal administration building is in background.



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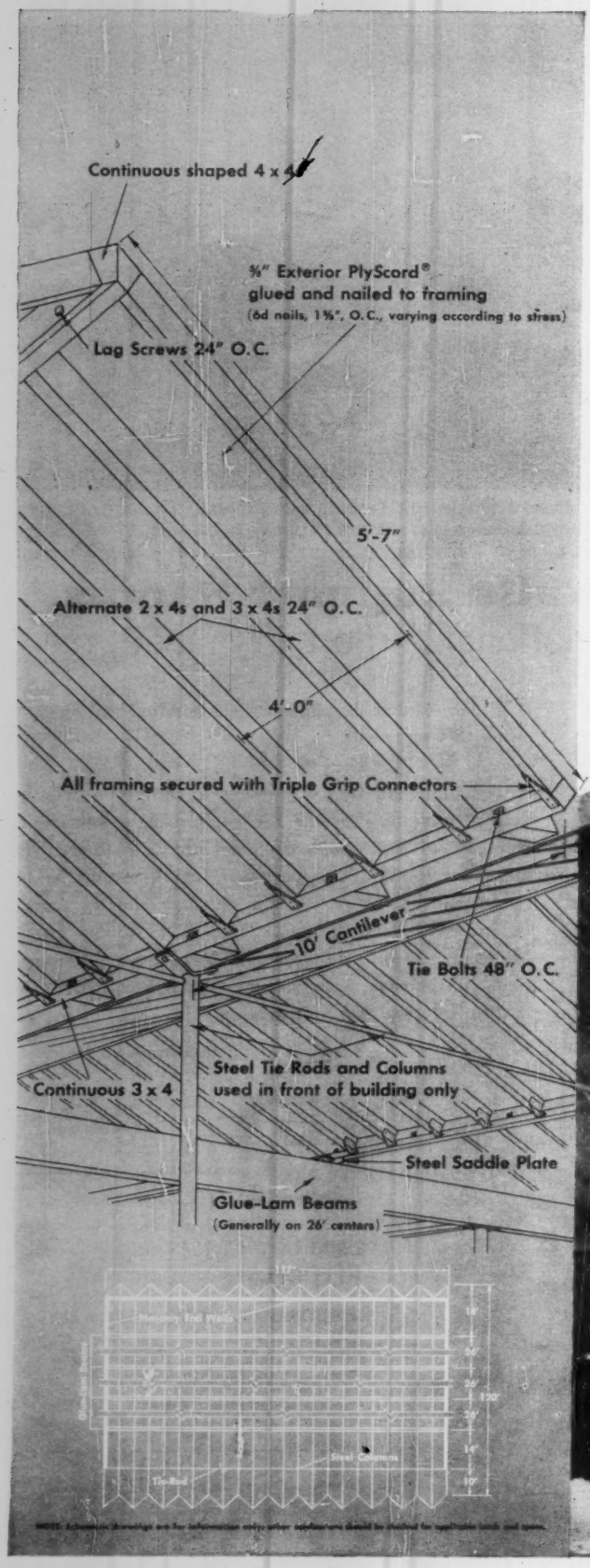
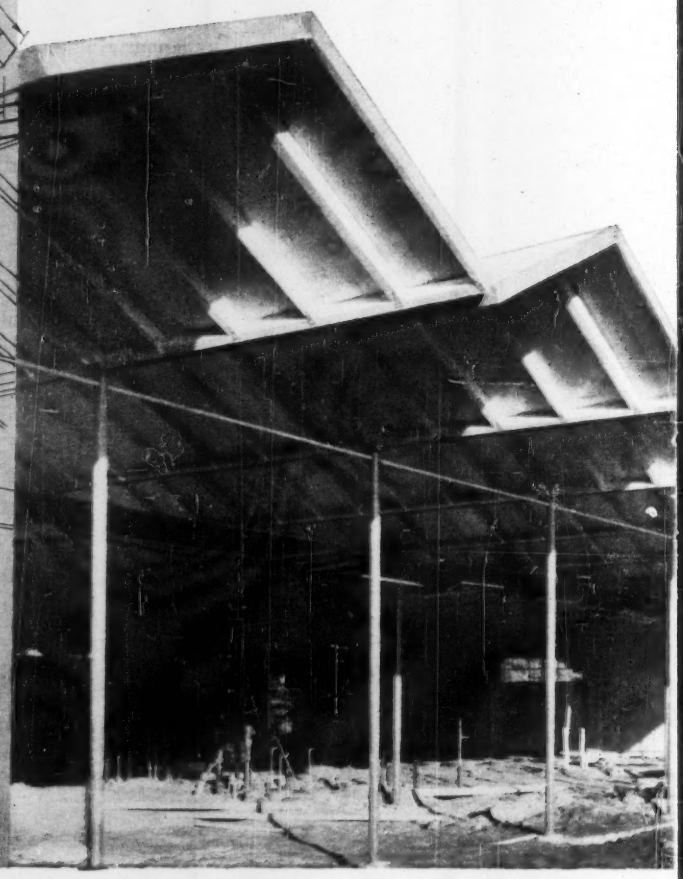
New low-cost covers


Continuous shaped 4 x 4
⅝" Exterior PlyScord®
glued and nailed to framing
(6d nails, 1⅛", O.C., varying according to stress)
Lag Screws 24" O.C.
5'-7"
Alternate 2 x 4s and 3 x 4s 24" O.C.
4'-0"
All framing secured with Triple Grip Connectors
10' Cantilever
Tie Bolts 48" O.C.
Steel Tie Rods and Columns
used in front of building only
Continuous 3 x 4
Steel Saddle Plate
Glue-Lam Beams
(Generally on 26' centers)

YEAKEL-POWELL BUILDING
LOCATION: Burien, Wash.
ARCHITECT: Jack N. Bryant, A.I.A.
STRUCTURAL ENGINEER: Harvey H. Johnson
CONTRACTOR: Powell Construction Co.



fir plywood folded plate roof 14,000 sq. ft. in only 9 hours

Fabricated on the job with common labor, new roofing system costs 10-20% less than conventional construction—provides attractive appearance, superior structural values.

THIS PRECISELY ENGINEERED folded plate roof—the first of its kind using lumber-framed plywood sections in series—offers several unique advantages:

Low cost and fast job-site assembly using common labor. Plywood components were installed by a 6-man crew in less than nine hours. Total costs, including all labor and materials, came to less than 80c per square foot—a figure some 10 to 20 percent less, locally, than joist or truss construction accomplishing the same clear floor area.

Structural simplicity. The roof consists of 11 plywood folded plates which rest on four glue-lam beams. Each of the inclined planes is a rigid plywood diaphragm, paired to form a giant self-supporting inverted V-beam which spans 10 feet from valley to valley and 26 feet from beam to beam. Posts, trusses and purlins are eliminated and the architect estimates that spans could be almost doubled where called for by the design.

Design adaptability. The plywood folded plate system provides large, clear floor areas and freedom in arranging—or rearranging—interior partitions. The folded plate creates an unusually attractive profile, with bays defining individual store areas.

FOR INFORMATION about fir plywood folded plate construction or other data—write

DOUGLAS FIR PLYWOOD ASSOCIATION

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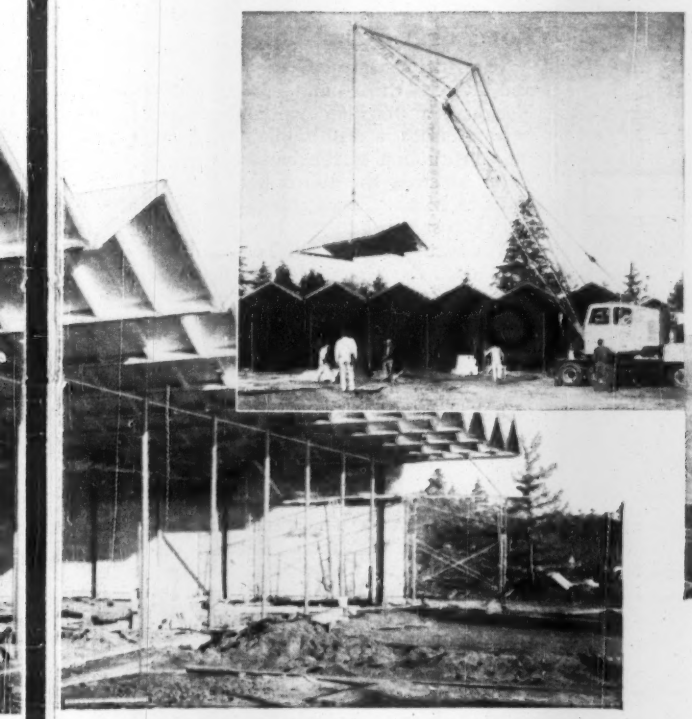
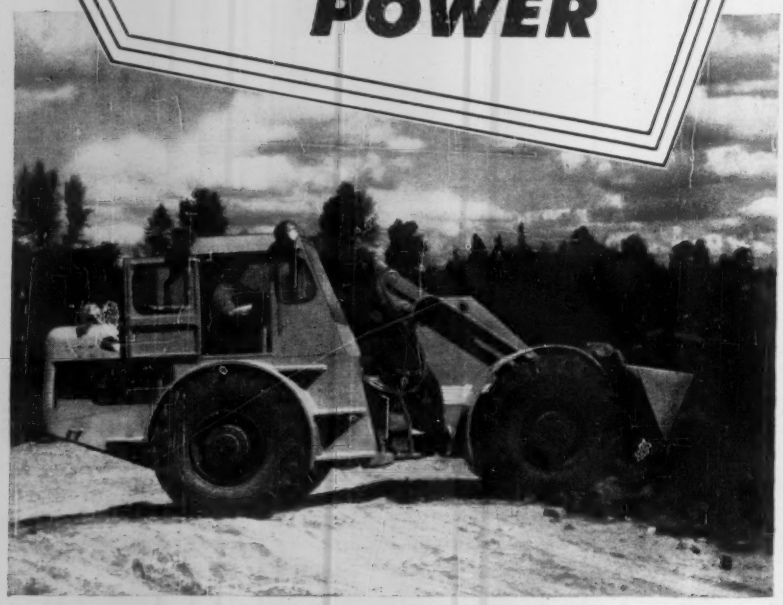


Fir plywood folded plate components were built on ground, crane-lifted into position in pairs. Heaviest lift was about 1,000 lbs. Contractor was impressed with the ease with which his crew assembled and erected sections.

The folded plate provides distinctive profile, freedom in placement of interior partitions. The front was given a 10' overhang to cover store entrances. Underside was covered with medium density overlaid plywood to provide smooth, check-free paint base.

LOADING SHOT ROCK
takes EXTRA POWER



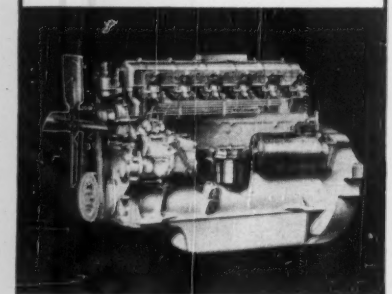
SCOOPMOBILE does it easily with

WAUKESHA Diesel

● Tough stuff to load—that shot rock! Takes a real loader with an engine that can pour on the power. With its Waukesha Diesel, and 100% breakout bucket action, this 1½ cu. yd. LD 5P Scoopmobile handles a lot of yardage for Bowman Sand & Gravel Co., Albany, Oregon—steadily, smoothly, quickly. Four-wheel planetary drive gives power to spare. Power steering, power shift forward and reverse transmission, and 4-wheel power brakes lighten the work of the operator. Waukesha Diesels also give you easy starting, quick warm-up, snappy acceleration, with high fuel economy and most economical upkeep.

372

POWERING the SCOOPMOBILE



Waukesha 190-DLC Diesel—Six cylinders, 3¾ x 4-inch, 265 cubic inch displacement. Send for descriptive bulletin 1411.

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN

NEW YORK TULSA LOS ANGELES

for the Northwest Territories and the Yukon is expected to top last year's $71 million. Municipalities, last year, spent about $167 million on city and suburban roads, and the figure will undoubtedly go higher this year.

Heat the North Pole?

Polar region can be made 60 deg warmer, say Soviets

By building a 43½ mile dam from the Chukchi Peninsula to the coast of Alaska, Pacific cold currents will be stopped from flowing into the Arctic Sea, causing the water level of the Arctic Sea to drop. More of the Gulf Stream will flow into the polar region and it will then warm Siberia and Alaska, acting as the pipes of a hot water heating system and melting the Arctic ice mass.

This was the gist of a lecture, "Can the Earth's Climate Be Changed?", given last month at Moscow's Polytechnic Museum by Engineer Piotr Borisov. According to the lecturer, the average annual temperature on the North Pole will rise by 60 deg F and reach 41 F on the new Siberian Islands. This would make it possible for the tundra, with an area of some 740 million acres, to be turned into fertile agricultural land, and the rivers of Siberia, Alaska and Canada would become navigable throughout the year.

British Firm Gets Contract For Large Brazilian Dam

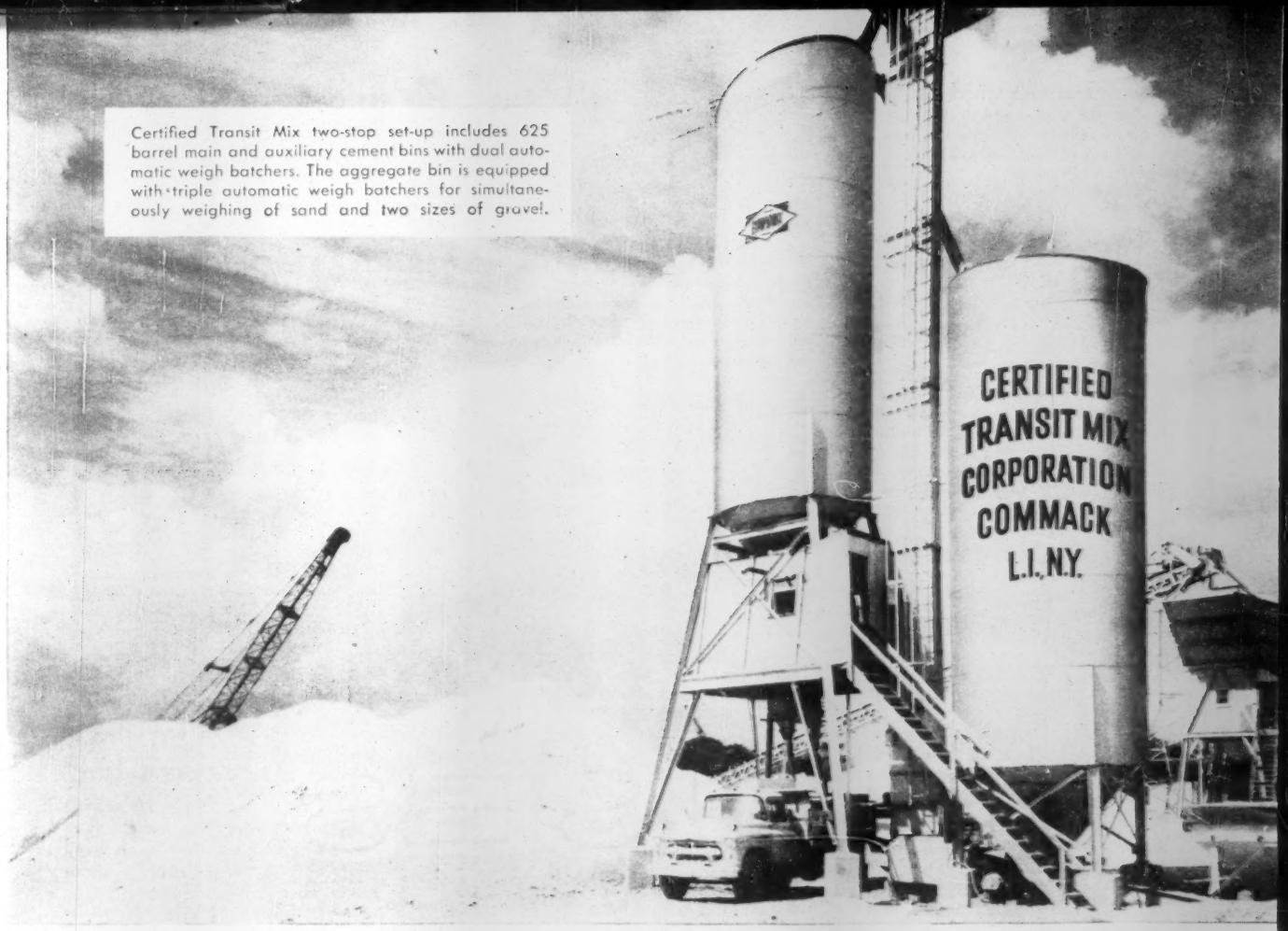
The British firm of George Wimpey and Co., Ltd., and Construtora Nacional, a Brazilian contractor, have been awarded a $40 million contract for construction of the biggest dam in Latin America, the 400 ft high Furnas Dam in Minas Gerais state. The contract is cost plus fixed fee type.

The earth and rock filled dam will be located on the Grande River 240 miles west of Rio de Janeiro. Its power station capacity is to eventually reach 1.1 million kw.

Two units of 92,000 kw are expected to be installed by mid-1962, with another three units of 92,000 kw capacity each to be completed the following year.

A second contract for $40 million worth of power generating equipment will be awarded some time this fall, when foreign financing will be obtained.

Bids for the large dam were submitted by 22 combines, each of which had to include a Brazilian firm. Six leading U.S. firms were among the bidders.



Certified Transit Mix two-stop set-up includes 625 barrel main and auxiliary cement bins with dual automatic weigh batchers. The aggregate bin is equipped with triple automatic weigh batchers for simultaneously weighing of sand and two sizes of gravel.

Blaw-Knox Batch Plant helps set Illinois Toll Road Paving Record

Electronically controlled, fully automatic batch plant is the most advanced in road construction history

Fifteen-second batching to rigid specifications and close weight tolerance is the performance record of the Blaw-Knox Batch Plant that made possible the paving of 3100 feet of 25-ft. wide, 10" thick concrete in a single day on the Illinois Toll Road.

Production line handling of cement and aggregates coupled with features like simultaneous proportioning of sand and two sizes of gravel at the touch of a button, helped the Certified Transit Mix Corporation of New York maintain a daily production average of 1,600, 1.38-cubic-yard batches. Truck loading was geared into a continuous operation which kept thirty-two batch trucks on the seven mile run to the paving site. Warren Morreale, superintendent for Certified Transit Mix, credits the "smooth operation" of electronically controlled, fully automatic Blaw-Knox Batch Plant in maintaining the record output.

If you are looking for high production to tight specifications, let Blaw-Knox engineering experience and production know-how go to work for you. Your Blaw-Knox distributor can help "tailor" a rugged, automatic, high performance batch plant to your exact needs. And if you'd like the full story of the record-setting Blaw-Knox Batching and Paving Equipment on the Illinois Toll Road, write the Construction Equipment Division for a free copy of Reprint C.

BLAW-KNOX

BLAW-KNOX COMPANY

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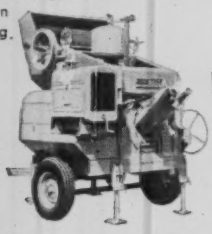
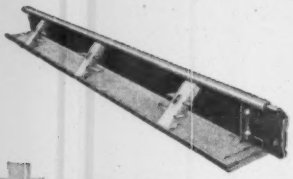
41 Charleston Avenue, Mattoon, Illinois

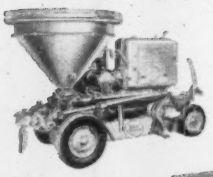
REX BUILDING MIXERS—in all popular sizes, half-bag to three-bag. All are built with traditional Rex quality—more rugged, more lasting, more maintenance-free. One-man spotting and hitching.

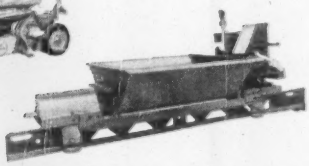




REX FORMS—the simplified setup line with built-in alignment ease. Double-wedge road forms, airport forms, combination curb and gutter forms, curb forms, flexible forms and sidewalk forms. All wanted sizes and types—all ready for fast delivery to you!

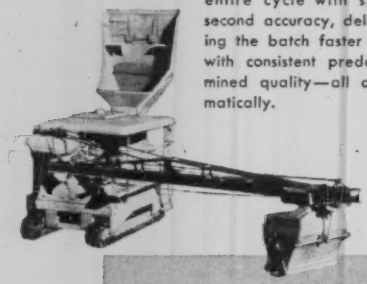
REX PUMPCRETE—pumps concrete through portable pipeline up, down, straight and around turns. Saves on preparatory work, protects concrete quality; no chance of segregation of mix.





REX RAILPORTER—for rapid, lowest-cost placement of concrete and bulk materials. Railporter travels, stops unattended on a single portable rail—is fast, easy to set up.

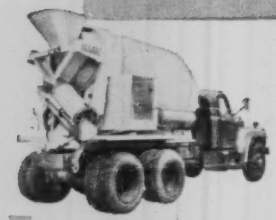
REX PAVERS—today's greatest yardage pavers. Greatest operating ease, too. Rex Exclusive Hydrocycle Control takes over entire cycle with split-second accuracy, delivering the batch faster and with consistent predetermined quality—all automatically.



Get REX "PLUSES"

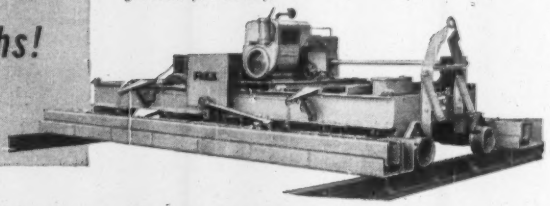
the leadership line that has upped the limits of performance to new highs!

REX PUMPS—for top speed and efficiency in all your dewatering jobs. Self-priming centrifugal pumps in 4000 to 90,000 g.p.m. capacities. Operated by electric motor, or gasoline or diesel engine.



NEW REX MOTO-MIXERS—the "cleanest look" of all! Modern, simplified design based on research of what the ready-mix operator wants and needs in a truck mixer. Faster, easier cleanups; lower maintenance. Widest option choice.

REX ROAD FINISHING EQUIPMENT—the high-production line of spreaders, finishers, floats, curing machines, belt and burlap drag machines, subgrade planers and testers. All are designed for efficient operation, maximum operator convenience and greatest portability.



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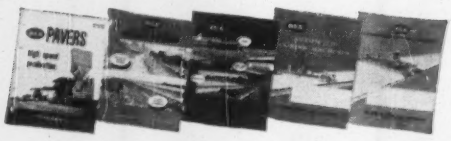

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MOTO-MIXERS • BINS AND BATCHERS • BUILDING MIXERS • PUMPCRETE • RAILPORTER

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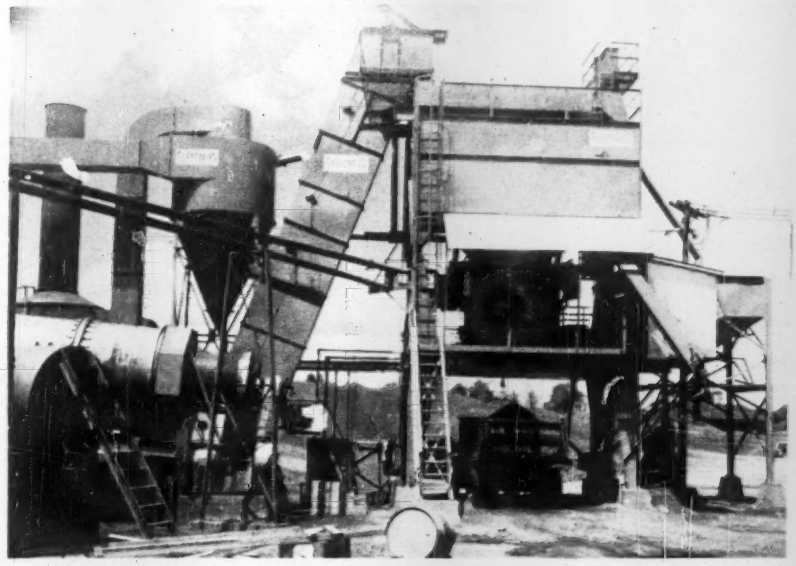


Batch-type bituminous mixing plants cost less since . . .

Self-Erecting Features Are Left Out

The Model H Series is a new line of batch-type bituminous mixing plants for stationary or semi-permanent installations. Available in six sizes, covering capacity ranges from 45 to over 240 tons per hour, the Cedarapids plants are designed without running gear or self-erecting equipment to lower initial cost. The sectionalized units can be erected quickly by crane and transported, when necessary, on low-bed trailers.

In other respects, these plants have most of the same features found on Cedarapids Model G Series portable plants, on the market for five years. The Model H Series is made up of 10 basic units, including production-balanced mixer, drier, dust collector and feeder units, which can be combined into different engineered arrangements to meet specific job conditions. Iowa Mfg. Co., Cedar Rapids, Iowa.

Unit Lifts, Digs and Transports

A multi-purpose piece of equipment that can lift loads, dig a hole or transport men and materials to and from a job has been announced. It is called the Pitman Hydra-Lift, Model 60 HB. It is equipped with a hydraulic digger attachment and installed on the customers truck as shown.

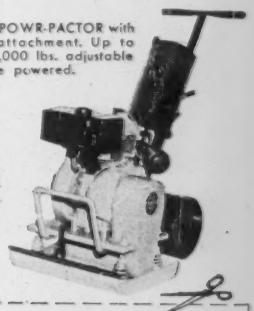
Powered by the same hydraulic system that powers the Hydra-Lift itself, the digger attachment handles augers with diameters up to 24 in. With the

MAGINNISS
POWR-PACTORS
patch asphalt faster!

Maginniss *vibratory* compactors speed placing and patching of blacktop . . . are easily moved from job to job . . . work fast, at speeds up to 50 ft. per minute. Water feed prevents asphalt adhesion . . . assures smooth finish.

Put Maginniss Powr-Pactors to work on your blacktop jobs. The increased production, lower costs and small initial investment will surprise you. Call your Maginniss distributor today! Maginniss Power Tool Company, 154 Distl Avenue, Mansfield, Ohio. AA-7621

MODEL PP-18 POWR-PACTOR with water feed attachment. Up to 7,000 vpm, 4,000 lbs. adjustable force, gasoline powered.



Maginniss POWR-PACTOR VIBRATORY COMPACTOR

Maginniss Power Tool Company
154 Distl Ave., Mansfield, Ohio
Yes, I want to know more about the Powr-Pactor for asphalt work.

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address _____

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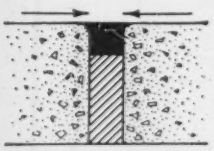
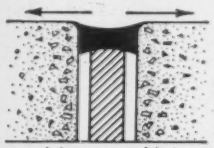
for *EFFECTIVE* joint sealing

HOT POURED PARA-PLASTIC®

Para-Plastic is the *original* hot poured rubberized asphalt joint sealing compound that forms a resilient, adhesive and effective seal which maintains bond at sub-zero temperatures. Unaffected by extremes of temperature, Para-Plastic insures a moisture-tight seal of expansion, contraction and dummy joints in concrete pavement of all types. Para-Plastic JF is a special hot poured rubberized thermoplastic compound especially developed for sealing joints in pavement where they would be affected by spillage of jet fuel or other petroleum solvents used by aircraft.



Joints compressed in warm weather temperatures.



Joints opened in sub-zero temperature.

Drawings at right illustrate sealing characteristics of Para-Plastic Joint Sealer during extremes of temperatures.

COLD APPLIED ZERO-LASTIC®

Cold-Applied Zero-Lastic is available in two types: 1. Ready mixed regular Zero-Lastic designed for sealing narrow joints (⅛" and 3/16" wide) in concrete pavement where application of other types of material would be difficult without special equipment, and 2. Zero-Lastic JF a two-component jet fuel resistant sealing compound which sets up into a resilient rubber-like seal which is resistant to damage from petroleum solvents, for sealing joints in airfield aprons and other concrete pavement used by aircraft. Applied with pressure application equipment.

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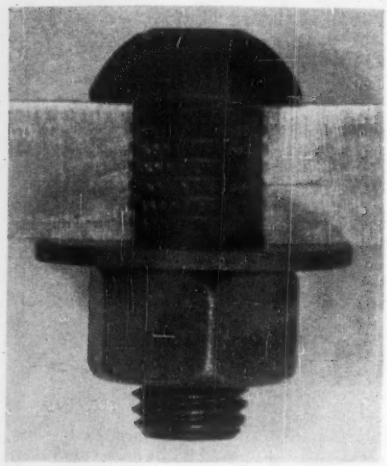
digger on Hydra-Lift's swinging boom, the operator can dig a hole at any point within 180 deg angle and a 26-ft radius of the truck, say the manufacturers. This means that there is no need to move the truck when you want to dig a hole across a ditch, over a fence or on a slope. The operator can also use the Hydra-Lift to set a pole without removing the auger attachment. Pitman Manufacturing Co., 300 W. 79th Terrace, Kansas City, Mo.



Knurls Produce Tight Fit For New High-Tensile Bolt

Steel fabricators soon will be able to buy a new type of bolt called a High Tensile Bearing Bolt. It, according to the manufacturer, is superior to—yet will cost no more than—a conventional high-tensile or Dardelet bolt.

The new product is a conventional high-tensile bolt with knurls added to produce a body-bound fit. It is made of steel, meeting ASTM A-325 Specification. Yet, according to tests conducted at the University of Illinois, it has higher shear and bearing values and greater slip resistance than conventional high-tensile bolts or rivets because it is in initial bearing, filling the hole.

The head of the bolt is flat on top to permit driving with an impact tool, and the remainder is shaped like a rivet head to permit driving with a riveting hammer. The bolt drives relatively easily and also may be pulled into place with a standard nut at torques well below the final assembly torque. In field erection tests, speeds of 350 bolts per man per eight hour shift—excluding nut impacting—were attained with relatively little experience.

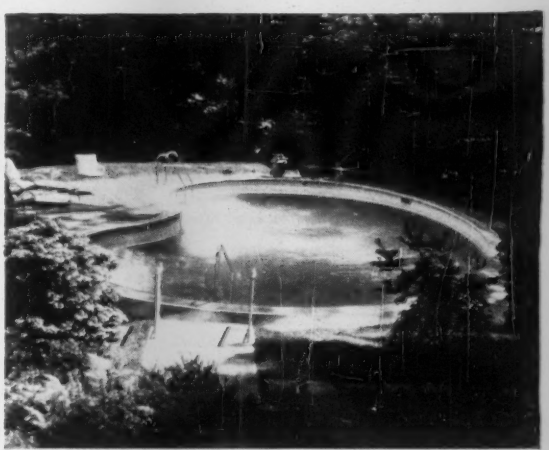
According to the manufacturer, the knurls pull in or drive in easily because of three design features: The frontal

LOW COST STEEL PIPE HELPS PUT SWIMMING INTO YOUR BACK YARD!

Home swimming pools, once an unaffordable luxury for most families, are now available at prices within the reach of many, thanks to new, cheaper construction methods and inexpensive materials such as *steel pipe*.

In the 30,000 back yard pools that will be installed this year, reliable *steel pipe* will be used variously for supply and drainage lines, ladders, filtration systems, diving board supports . . . yes, even to radiantly heat the water if desired!

Steel pipe because it is the least expensive and most versatile of metal tubular products, contributes to the economic availability of so many good things in life. Yes, *steel pipe* is the most widely used pipe in the world for radiant heating, snow melting, fire sprinkler systems, vent and drainage lines, electrical conduit, structural uses, refrigeration, gas, oil and water lines.



Pools like this and the one above are within the financial reach of many 2-car families and low-cost *steel pipe* helps to make this true.

STEEL PIPE IS FIRST CHOICE

- Low cost with durability
- Strength unexcelled for safety
- Formable—bends readily
- Weldable—easily, strongly
- Threads smoothly, cleanly
- Sound joints, welded or coupled
- Grades, finishes for all purposes
- Available everywhere from stock

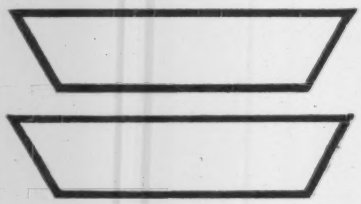
COMMITTEE ON STEEL PIPE RESEARCH

AMERICAN IRON AND STEEL INSTITUTE

150 East Forty-Second Street, New York 17, N.Y.

TRICKY TRACINGS

Question: At a glance, can you tell which of the two pans is larger? See answer below.



YOU'RE ALL RIGHT IF IT'S ARKWRIGHT TRACING CLOTH

Whichever way you figure it, Arkwright Tracing Cloths offer more for your drafting dollars. Made to meet Government specifications, Arkwright's superior surface is completely free of pinholes, coarse threads and other imperfections which cause feathering or blobbing. Its permanent transparency eliminates discoloring and brittleness . . . protects your drawings against the wear and tear of time and constant handling.

Even on the most detailed drawings, Arkwright's perfect working surface assures fast, accurate workmanship . . . provides crisp, clean reproductions. In the simple drawing above, the pans are of equal dimensions.

Be sure . . . use the tracing cloth with the blue line . . . Arkwright. Write for trial samples today. Arkwright Finishing Co., Industrial Bank Building, Providence, R. I.

ARKWRIGHT
Tracing Cloths
AMERICA'S STANDARD FOR OVER 35 YEARS

. . . New Products

shape of each knurl is a section of a small ball; the back face is relieved somewhat like a drill or tap, thus preventing packing of displaced material; and they are on a spiral, based on the principle that turning reduces driving load. In driving, the knurls engrave the joint material with rounded-bottom grooves producing in the holes a cold-working effect that offsets any notch effect of the grooves.

The bolt can be assembled wherever a conventional high-tensile bolt can be used in regular punched or drilled holes. As in the use of high-tensile bolts, however, holes misaligned more than ⅛ in. should be reamed or drifted. Lamson & Sessions Co., 5000 Tiedeman Road, Cleveland 9, Ohio.

. . . New Product Briefs

• **Large capacity pumps**—New 2 in. and 3 in. self-priming centrifugal pumps have ratings of 12,000 and 18,000 gal per hour and are available with 6 hp Wisconsin, Briggs & Stratton, or Clinton engines. They are mounted on two rubber tired wheels. Midland Pump Div., Midland Products Co., Midland Park, N. J.

• **Ceiling grinder**—Model CG 16 designates a new grinder marketed for finishing 13 to 16 ft high ceilings. A 9 in. abrasive grinding head, mounted at the top of a wheeled, telescoping frame, connects to a ¾ hp electric motor at the bottom of the frame by a flexible tool shaft. It is reported that the grinder eliminates the need for scaffolding and finishes up to 500 sq ft per hour. Stow Manufacturing Co., 443 State St., Binghamton, N. Y.

• **Brick bath**—A new masonry cleaner, shipped in unbreakable polyethylene containers, is reported to be just as effective as muriatic acid for dissolving lime mortar and cleaning brick, and will not burn workers using it. The plastic container, sealed in a corrugated box, has a self contained pouring spout and handle. Goldblatt Tool Co., 1910 Walnut St., Kansas City 8, Mo.

• **Movable walls**—The new Type HP Hauserman wall system combines low initial cost with many of the design refinements of premium priced prefabricated wall systems, according to the manufacturer. The steel and glass units are completely reusable. Fireproof and sound resistant, the panels feature single line joints without exposed posts. E. F. Hauserman Co., 2100 Keith Building, Cleveland 15, Ohio.

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The reel of Roebling Stress-Relieved Strand for prestressed concrete that you see here is but one of many elements of prestressed concrete . . . every one of which Roebling is familiar with and many of which Roebling has instituted and developed.

Fourteen years of experience in every aspect of the prestressed concrete field—tensioning elements, strand development, design procedures, the development and introduction of the stress-relieving process for the uniform behavior of tensioning wires and strands—enable Roebling to *deliver* much more than the strand on the reel.

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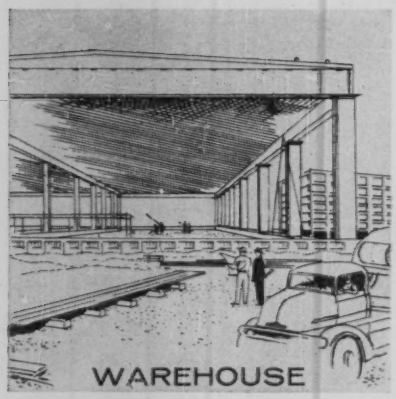
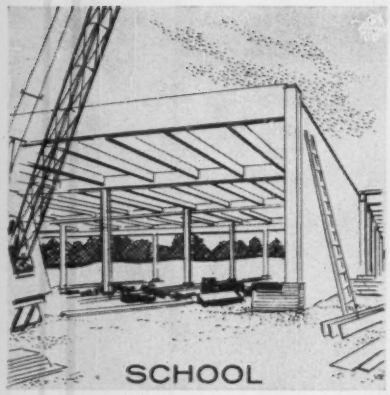
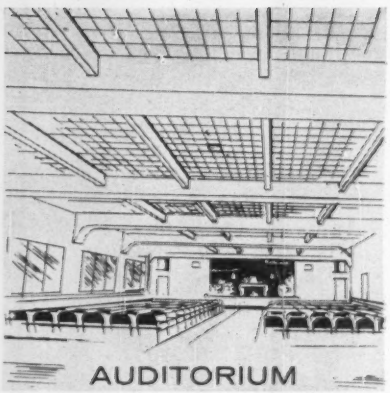


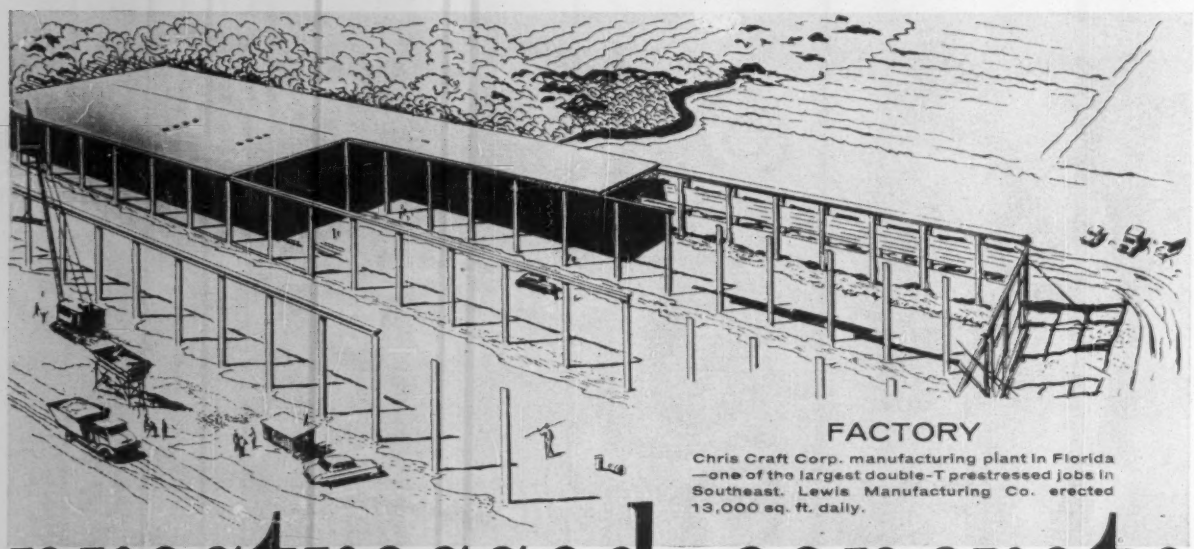
WAREHOUSE



SCHOOL



AUDITORIUM



FACTORY

Chris Craft Corp. manufacturing plant in Florida —one of the largest double-T prestressed jobs in Southeast. Lewis Manufacturing Co. erected 13,000 sq. ft. daily.

prestressed concrete

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Experience and imagination are the "plus" factors Freyssinet Affiliates use to meet today's great challenge of low-cost fabrication. You get *all* the advantages of prestressed concrete for *any* structure through the worldwide Freyssinet network of specialists. This means maximum design economy and speed of construction through precision fabrication. Factory production methods allow components to be carefully tested and stored . . . on-the-job costs are reduced . . . and you get "on schedule" delivery and quick installation.

Each Freyssinet Affiliate's plant is equipped to manufacture any type or size of concrete structural unit on universal pretensioning beds. Uniform standards of design and quality control exceeding Federal and ASTM requirements are assured because each Affiliate retains skilled Freyssinet engineers.

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Portland 20, Oregon

The Formigli Corporation
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Oregon Sewers Bid Four Ways

Rubber ring joint on concrete pipe takes contract away from pneumatically grouted joint alternate

The second phase of the sewage disposal project for the City of Roseburg, Ore., includes 9,300 lin ft of 36 in. sanitary interceptor sewer and 8,288 lin ft of 24 in. and smaller mains. The city's $287,467 award to Salem Sand & Gravel Co., Salem, Ore., was on Alternate B concrete pipe for the interceptor sewer. This alternate called for rubber joints, while Alternate A called for pneumatically grouted joints.

Concrete pipe was preferred for the siphons over cheaper concrete cylinder pipe of minimum design pressure conforming to SS-P-381.

Salem's bid breaks down like this:

	Amount	Cost per lin ft	% of Total
Schedule I. Interceptor	$193,002	$20.75	66.4
E. Sewer Mains	97,465	11.76	33.6

Cornell, Howland, Hayes & Merryfield, Corvallis, Ore., are the consultants.

The sewer will lie along the south bank of the S. Umpqua River and north bank of Deer Creek. One siphon crossing on the river is in two sections totaling 1,200 ft of crossing, most of it along the high bank of the river and a creek over private property. A tunnel will run under the Southern Pacific Railroad & N.E. Stephens St., and under U. S. Highway 99.

The contractor furnishes all materials.

Concrete pipe, Classes II and IV, conform to ASTM C 76-57T. The D loads are equal to 1,000 and 3,000 respectively.

Wages include: tractor operators, $3.20; shovel and crane operators, $3.38 and $3.26; pipe layers, $2.85; common laborers, $2.65, all including fringe benefits.

The bids on the sanitary interceptor sewer went like this:

Bids: 3-10-58 Items	Unit	Quantity	Unit Prices 1C	2
Exc, trench & cl C bkfl, 0-6'	lf	111	$1.50	$1.25
6-8'	lf	36	1.70	1.50
8-10'	lf	224	2.00	1.80
10-12'	lf	417	2.40	2.20
12-14'	lf	991	2.75	2.75
14-16'	lf	1,310	3.10	3.50
16-18'	lf	1,856	4.15	4.50
18-20'	lf	1,730	4.90	5.50
20-22'	lf	539	5.90	6.80
22-24'	lf	33	7.80	8.00
& cl D bkfl, 18-20'	lf	50	13.70	14.00
20-22'	lf	469	16.40	16.50
22-24'	lf	163	19.80	18.00
rock	cy	100	30.00	16.00
riprap	cy	300	7.00	8.00
Base stab, gravel	cy	50	5.00	3.00
Concrete pipe, 36", in place				
alt A pneu grtd jts, cl 2	lf	715	9.55	9.25
cl 4	lf	7,214	9.60	9.50
alt B rub ring jts, cl 2	lf	715	8.55	9.00
cl 4	lf	7,214	8.60	9.25
Gravel base for pipe	lf	7,929	0.50	0.45
Service conn stub-out	ea	10	50.00	6.50
MH, std precast, 6'	ea	15	150.00	160.00
additional depth	lf	160	10.00	17.50
Conc deflection collar	ea	9	100.00	25.00
Pavement remove	lf	530	1.25	1.50
Pit run gravel	cy	160	3.50	3.00
Athletic track surf, cr rock	cy	30	5.00	4.00
Conc sidewalk	lf	7	5.00	3.50
Curb xing	ea	2	30.00	15.00
Under xing, veterans rd	ls	job	1,760	1,650
U.S. Hwy 99	ls	job	9,780	12,000
Conc pipe siphon xing -1	ls	job	33,193	41,400
-2	ls	job	23,000	35,800
Connection to existing sewer sta 38+59.5	ls	job	450.00	200.00
52+09.5	ls	job	230.00	250.00
59+45.1	ls	job	160.00	175.00
72+03.5	ls	job	210.00	300.00
Flap gate	ls	job	350.00	425.00

The bidding on the sewer mains went like this:

1C Salem Sand & Gravel Co., Salem, Ore	$97,465
2 E & W Const. Co., Eugene, Ore	97,808
3 Den Herders Constr., Inc., Lebanon, Ore	118,652

A fourth bid is irregular

Bids: 3-10-58 Items	Unit	Quantity	Unit Prices 1C	2
Exc, trench & cl C bkfl, 0-6'	lf	949	$1.95	$1.30
6-8'	lf	4,036	2.25	1.80
8-10'	lf	1,047	2.60	2.40
10-12'	lf	677	2.90	3.00
12-14'	lf	366	3.45	3.60
14-16'	lf	98	4.30	4.20
16-18'	lf	10	5.20	5.40
cl D bkfl, 0-6'	lf	298	3.65	3.40
6-8'	lf	182	4.15	4.20
8-10'	lf	608	4.80	5.40
10-12'	lf	781	5.75	6.60
12-14'	lf	40	7.00	7.80
rock	cy	275	12.50	12.50
Concrete encasement	cy	10.5	35.00	30.00
Rock riprap	cy	17	10.00	12.00
Base stab gravel	cy	20	5.00	6.00
Conc sewer pipe, ip, 8"	lf	2,524	1.60	1.55
10"	lf	2,866	2.00	2.00
18"	lf	110	4.60	4.35
24"	lf	3,599	5.30	6.25
Pier support steel, 8"	lf	189	10.00	7.00
Grav base, pipe 15" & under	lf	5,390	0.35	0.30
15" & over	lf	3,709	0.40	0.40
MH frame & cover, std	ea	21	135.00	150.00
Watertight frame & cover	ea	16	155.00	180.00
MH, drop, std precast	ea	2	250.00	225.00
additional depth	lf	106	10.00	13.50
conn to existing	ea	4	80.00	60.00
Pavement remove	lf	1,153	1.50	2.00
Pit run gravel	cy	174	3.50	3.00
Crushed rock surfacing	cy	85	5.00	4.20
Concrete walk & slab	lf	20	5.00	1.50
Curb xings	ea	2	30.00	10.00
Hwy & RR undercross				
Stephen St	ls	job	9,600	9,000
Winchester St	ls	job	300.00	360.00
Deer Cr. siphon crossing	ls	job	8,500	8,450
Conn to existing sewers				
div. at new MHs	ea	3	100.00	120.00
Rowe St	ls	job	500.00	258.00
Service connection	ea	250	5.00	2.50
conc wyes, 8x5"	ea	25	7.00	6.00
10x6"	ea	35	10.00	9.00
24x6"	ea	10	30.00	30.00
changeover of exist serv	ea	5	100.00	27.00

Commence: 5-1-58 Complete: 11-1-58

Liquidated damages: $50/day

Alternate A (pneumatic grouted joints) with Concrete Pipe for Siphons

1 Salem Sand & Gravel Co., Salem, Ore	$220,931
2 C. H. Strong Eng. & Constr. Co., Eugene, Ore	223,780
3 Jeske Bros. Constr. Co., No. Eugene, Ore	223,997

Alternate B (rubber ring joints) with Concrete Pipe for Siphons (Contract)

1C Salem Sand & Gravel Co., Salem, Ore	193,002
2 Jeske Bros. Constr Co, No. Eugene, Ore	222,014
5 Den Herders Constr. Co., Inc., Lebanon, Ore.	262,310

Alternate A with Concrete Cylinder Pipe for Siphons

1 Salem Sand & Gravel Co., Salem, Ore	195,138
2 Jeske Bros. Constr Co, No. Eugene, Ore	223,997
5 C. H. Strong Eng. & Constr., Eugene, Ore	225,713

Alternate B with Concrete Cylinder Pipe for Siphons

1 Salem Sand & Gravel Co., Salem, Ore	187,209
2 Jeske Bros. Constr. Co., No. Eugene, Ore	222,014
5 P. S. Lord Mech. Cont., Inc., Portland, Ore	273,816

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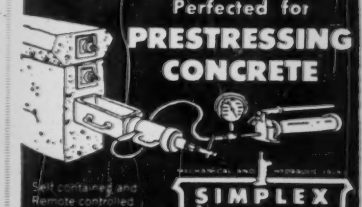
SIMPLEX Center Hole Hydraulic PULLERS

Perfected for PRESTRESSING CONCRETE



Self contained and Remote controlled pumps and rams in capacities 10 100 tons

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Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES

- Cement, Aggregate Ready-mixed Concrete, Asphalt: Last, Jun. 5; Next, Jul. 10
- Iron and Steel Products, pipe: Last, Jun 12; Next, Jul. 17
- Wage Rates, Building Board, Lath, Insulation: Last, May 29; Next, Jul. 3
- Wood Products, Glass, Explosives, Chemicals: Last, Jun. 19; Next, Jul. 24

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE PARTITION—SCORED Per M. lots of 2,000 pieces or over, 3x12x12 in.	4x12x12 in.	8x12x12 in.	STRUCTURAL CLAY TILE—LOAD BEARING—SCORED Per M. lots of 2,000 pieces or over, 8x12x12 in.	10x12x12 in.	12x12x12 in.	BRICK Per M. in quantity Common backing	Straight hard	LIME Per ton, in paper, Carload lots, Hydrated finishing	Common hydrated	Pulverized or lump
Atlanta	$140.00p	$140.00p	$200.80p	$334.55p	.....	.....	$30.50p	$32.70p	$23.50	$24.50	$.....
Baltimore	217.00	231.00	434.00	491.00	602.00	690.00	36.00k	41.00k	35.60	23.20	.....
Birmingham	135.00p	152.00p	.....	303.00p	376.00p	465.90p	27.00ff	38.00y	35.02	22.30	26.33g
Boston	232.00†	248.00†	463.25†	556.00†	.....	.....	41.50p	46.50p	39.20†	31.20†	.....
Chicago	135.00	145.00	280.00	.....	.....	.....	30.00	32.00	38.00	35.20e	.....
Cincinnati	205.00j	225.00j	296.00jdd	213.00r	288.00j	314.00j	48.75r	47.00r	30.04r	26.04r	30.04j
Cleveland	209.00	223.00	.....	475.00	.....	.....	38.00	46.00gg	31.00	25.00	.....
Dallas	152.00	152.00	300.00	364.50	446.25	552.50	26.75	48.00	41.80	24.58	28.50
Denver	.....	.....	.....	.....	.....	.....	21.50	49.50	46.00p	42.00p	46.00p
Detroit	273.00	298.00	545.00	.....	794.00	906.00	47.50p	48.00p	38.00	34.00	.....
Kansas City	158.00	158.00	312.00	312.00	400.00	500.00	33.00	33.00	36.26	34.26	29.76
Los Angeles	r	r	r	r	r	r	32.50§	.....	38.00	38.00	39.00
Minneapolis	192.00p	215.00p	437.00p	215.00pw	.....	.....	45.60xp	54.00y	47.00bbe	37.00bbe	49.00bbde
Montreal	170.00au	178.00au	325.00aus	270.00q	400.00q	.....	48.256	56.306	39.00	22.00	13.25
New Orleans	186.00	186.00	380.00	380.00	.....	.....	42.00	55.00	44.00	32.00	32.00P
New York	176.90h	188.70h	283.00eh	295.50hn	.....	.....	44.00	.....	40.00	37.00	.....
Philadelphia	169.00	180.20	337.90	405.00	.....	.....	30/34	38/42	27.60	25.60	3.17m
Pittsburgh	147.50t	157.75t	295.00t	335.00t	435.00t	500.00t	39.00t	46.00t	36.00t	31.00t	.....
St. Louis	178.50p	185.00p	391.00p	401.00p	459.00	621.50	43.00l	41.50	0.95aa	.80aa	1.35s
San Francisco	156.85*	177.10*	235.30dd*	.....	.....	.....	43.00*	43.00*	29.24	29.24	31.74
Seattle	235.00p	270.00p	490.00p	265.00pnc	.....	.....	48.00	62.00	52.00bb	38.00bb	4.50mbb
Toronto	146.00	157.00	289.00	234.00f	395.00	.....	35.00	63.00	36.00	33.50	31.50

*§ F.o.b. Yard. **F.o.b. plant Stockton. *†F.o.b. yard Roxbury. *a Smooth. *b $4.50 del. *c 8 x 12 x 12 in.-6 cell. *d Pulverized hot. *e 8%, 10th following month. *f 8 x 8 x 12. *g Lumps, $26.72. *h F.o.b. trucks, job site N.Y.C *i 60 lb sacks. *j Truck load or over. *k $1.00 discount. *l Red face. *m Per bbl., 180 lb. processed. *n 7¾ x 7¾ x 12. *o Mason's double hydrated pressure. *p Truck lots. *q Provincial and Municipal tax extra. *r Not used; earthquake danger; *s 8 x 16 x 12. *t 2% cash. *u Incl. Federal tax. *v Sand lime. *w 5 x 8 x 12. *y Chi common. *z Pebble; 80 lb sack. *aa 50 lb sack. *bb LCL. *dd 8 x 12 x 12. *ff 80% common. *gg Smooth. $51.50 Rough.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

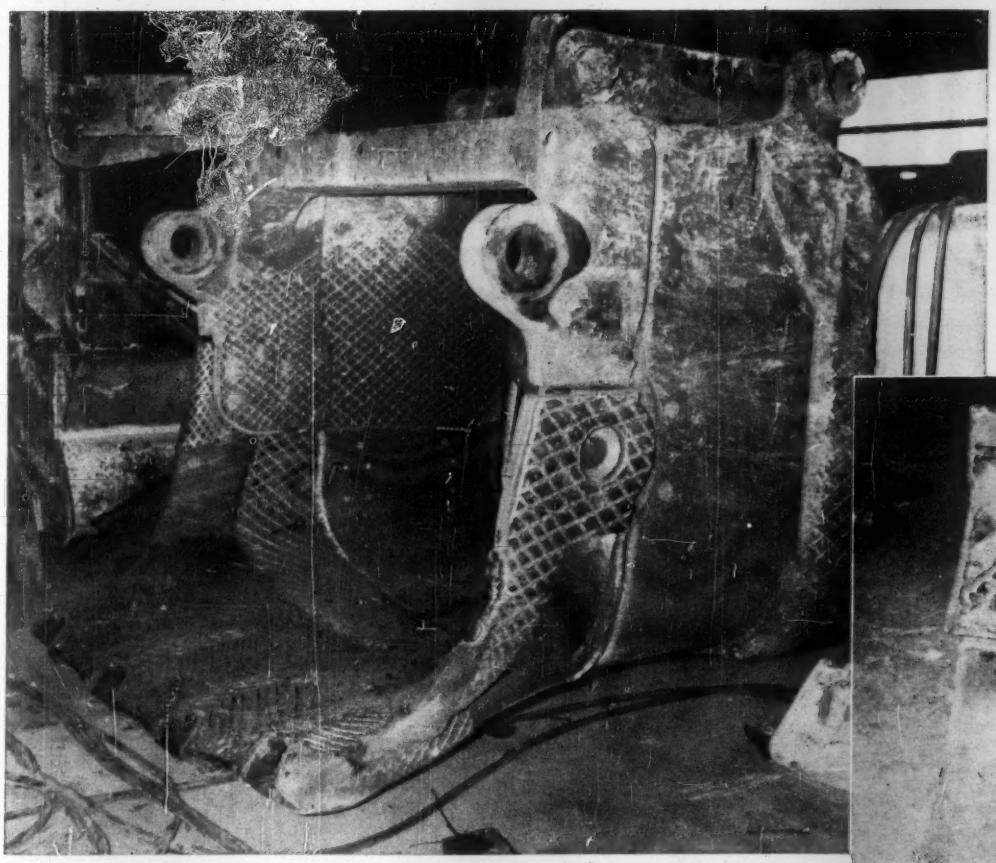
	RED LEAD Per 100 lb. in 500-lb. (Approx.) bbl. Dry a	WHITE LEAD Per 100 lb. in 100 lb. cases In oil w	READY-MIXED PAINT Per gal., drums Graphite b	Aluminum c	Ferric Oxide d	ROOFING SUPPLIES; Carload lots f.o.b. factory Rolls, slate surfaced, 85–90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 200 lb. bbl. per ton
Atlanta	$16.50	$30.125	$3.59	$3.86	$3.81	$3.39	$2.20	$2.62	$0.67	$57.75
Baltimore	16.25	29.75	3.00	4.40	3.50	2.78	4.25	4.25	.48	54.25
Birmingham	16.50	30.125	3.90	3.40	....	3.09	2.29ii	2.29ii	.82ff	45.00ee
Boston	16.25	29.75	....	....	....	3.30rq	2.23g	2.23g	.50g	58.00g
Chicago	16.25	29.75	....	....	....	3.65‡s	2.74‡s	2.98‡s	46.00‡bbs	57.70‡
Cincinnati	16.25	29.75	....	....	....	3.13	2.70	2.73	.428y	55.96
Cleveland	16.25	29.75	2.45pqq	2.57qqR	2.86pp	3.196q	2.268e	2.85	.501v	49.00qq
Dallas	16.50	30.50	....	3.20fi	....	3.00u	3.00s	3.00s	.470	66.00kk
Denver	16.75	30.25	3.98	5.20	3.70	2.49	1.90s	2.45s	44ff	50.00
Detroit	16.25	29.75	2.70	3.95	2.70	2.83	1.91f	2.49f	.432ff	51.00
Kansas City	16.25	30.50	3.99	3.43	3.01	2.72ii	1.82s	1.82s	.54y	.....
Los Angeles	16.25	30.00	3.80m	4.80m	4.20m	3.20m	2.15nii	l	.70mq	l
Minneapolis	16.25	29.88/29.75	....	....	....	3.29	2.45hi	2.42hi	.442i	50.00r
Montreal	.....	.....	5.02Dfl	5.94xfl	4.65kfl	5.40	4.65f	4.65f	1.60	....
New Orleans	.....	.....	....	....	....	2.34	1.63	2.85	0.680	....
New York	15.25C	29.75	....	....	....	3.20	2.16o	2.45o	.425s	49.00*
Philadelphia	16.25	29.75	3.60	3.40/3.65	3.80/4.00	3.00/3.30	2.54o	2.54o	.37/.45	48/54
Pittsburgh	16.25	29.75	2.20dE	2.25dF	2.25dG	3.37s	2.59s	.....	.45	.....
St. Louis	16.25	29.75	....	....	....	3.40nis	2.54hh	2.85hh	.44y	62.00
San Francisco	16.25	30.00	3.45	4.50	3.50	2.95	1.97aa	3.10	.460jj	54.00
Seattle	16.25	30.25	3.47	4.19ee	....	3.82nee	3.30kee	.....	.50ee	51.40ss
Toronto	.....	.....	5.00	5.75	5.50	5.40	4.15e	2.95o	1.70j	58.00A

*† Delivered. * Note: Red lead in oil 50% higher than white lead in oil. ** Aver. wt. approx. 425 to 550 lb drums. *a Red lead prices change frequently due to pig lead price changes. *b U.S. War Dept. Spec. 3-49A. *c ASTM Spec. D266-31. *d 80% minimum ferric oxide. *e 15 lbs. *f Per 432 sq ft. *g F.o.b. yard, Roxbury. *h Per roll, 65 lb. *i Net carload prices, Minneapolis and vicinity. *j 45 gal containers. *k Over 80% ferric oxide. *l Not used. *n F.o.b. city. *o Per 60 lb roll. *p 6-drum, 50 gal each. *q Per 90-lb roll. *r F.o.b. factory, Chicago. *s Truckload. *t Incl. Federal tax. *u Per 90-lb square. *v Per ton. *w Price to contractors $1.25 less. *x Ready-mixed. *y 55-gal container. *z Drums. *aa 15 lb. sq ft. *bb Roofers coating and cement. *cc LCL, truck delivery. *ee Asphalt pitch in 100 lb package. *ff 5-gal drums. *gg F.o.b. factory. *hh Incl. freight. *ii Per roll. *jj Asbestos roof coating. *A 400 lb barrels. *R ASTM Spec. D982-49. *C 98%. *D Std. black. *# Milt. spec.: E TTP27; F TTV81; G TTP31. *H Not quoted after Oct. 1957 *R revised.

PLASTER, VERMICULITE AND METAL BUILDING SHEETS & TUBING

	PLASTER‡ Neat per ton	Gauging per ton	VERMICULITE‡ Home Insulation pellets	Plaster aggregate	Concrete Aggregate Untreated	PERLITE‡ Plaster Aggregate	Concrete Aggregate Untreated	ALUMINUM SHEET†† Flat .102" th 36"x96" & 48"x144" per lb/ft	Corr roof .032" th 35"x12' per sht	STAINLESS STEEL† SHEET-TYPE 302g 20 ga 48"x96–120" per cwtth	28 ga 36"x120" per cwtmm	COPPER WATER* TUBING-TYPE L 2000 ft lots per ft ½"b	½"e
			per bag of 4 cu ft										
Atlanta	$31.00	$36.00	$1.55s	$1.65s	$1.80al	$1.65	$1.65	$0.422n	$8.97n	$61.44m	$67.50	$16.74f	$23.41f
Baltimore	23.80	34.60	0.95	1.15	1.15	1.15	1.65	0.431	0.489r	56.25	64.25	0.1674	0.2341
Birmingham	33.00	39.00	1.55	1.55	1.80l	1.55	1.55l	0.446	10.48	67.34	76.09	0.1608	0.2244
Boston	22.00	30.00	1.40	1.40	1.45	1.45	1.50	0.466	30.10p	65.42dd	71.92ddff	0.1562	0.2176
Chicago	26.80	26.80	1.55	1.60	1.60l	1.60	1.60	0.506x	10.148a	65.15aee	73.90aee	0.1562	0.2176
Cincinnati	28.00*	28.00*	1.75	1.75	1.75	1.85	1.90	0.434	9.56	65.28	74.03ff	0.1608	0.2244
Cleveland	28.00	44.70	1.13k	1.15ii	1.24l	1.45	1.45	0.486aa	8.28	65.33oo	74.08oo	15.62f	21.76f
Dallas	30.65	32.65	1.05	1.21	1.32	1.21	1.37	0.474	0.510r	67.00	80.75	0.1520	0.2170
Denver	25.00	25.00	1.50	1.40	1.50	1.40	1.55	0.446	10.09	66.30gg	75.05gg	0.1772	24.69
Detroit	26.00	25.00	1.28	1.32	1.41	1.54	1.28k	0.456a	10.376a	65.15a	73.90a	14.02f	19.00f
Kansas City	30.00	35.00	1.14	1.18	1.26l	1.18	....	0.444	11.40	67.50	76.25	15.62f	21.76f
Los Angeles	27.00	28.00	1.25k	1.20k	1.25	1.00	1.10	0.486	10.543d	67.10	75.85	0.1562	0.2176
Minneapolis	35.00	35.00	1.55	1.70	1.80	1.40	1.40	0.483	15.15w	65.71	72.21ff	0.1562f	0.2176f
Montreal	27.60h	35.60h	1.20	1.40	1.50	1.15v	1.15v	0.437	9.92	66.50	.....	0.1827	0.2160
New Orleans	34.00	48.00	1.25	1.25	1.25	1.25	1.25	0.424	8.593	71.50	72.45	0.1608	0.2244
New York	24.20	30.20	1.35	1.30	1.50	1.40	1.40	0.506a	10.14ad	68.58	77.33	16.08f	22.44f
Philadelphia	23/25	32.00	1.35	1.35	1.40l	1.05	1.05	0.44aw	9.46a	66/68a	75/77a	15.62f	21.76f
Pittsburgh	30.00nn	33.00nn	1.60nn	1.50nn	1.35	1.73	1.73	0.424	9.664	64.00	76.25ppR	0.1378	0.1920
St. Louis	29.00	40.00	1.35	1.60ff	1.50	1.60	1.60	0.456	10.37	68.11	74.61y	15.62fm	21.76fm
San Francisco	29.50	30.50	1.38	1.38	1.58	1.38o	1.58o	0.506	9.13	67.10	75.85	0.1562	0.2176
Seattle	42.40	45.60	1.55	1.25k	1.85l	*1.50k	....	0.586R	9.90	67.08	88.08	0.1562	0.2176
Toronto	28.00	45.50	1.20	1.30	1.45l	....	1.55	0.3995	24.00ae	73.74	86.52	0.2525	0.2684p

‡trucklots, delivered †fob warehouse *fob city *a delivered *b½" O.D. *c ⅝" O.D. *d 0.100"th *e 34" x 80" sheet *f per 100 ft *g 5 tons & up; cold roll, anneal & pickled 2B finish *h incl. Federal tax *i add 25¢ for pint of additive *j 1100 & 3003 alloy, mill finish *k bag of 3 cu ft *l treated with air entraining agent *m 2-10M ft *n fob mill fr allow *o 250 sacks or more *p 100 sq ft *r per lb. *s 30 lb bag *t 36" x 96;-10.81 lb/sh; 48" x 144"; 21.7 lb/sh *u 19.31 lb/sh *v fob plant *w 48" x 144" *x 100th *y 27 gauge *aa 16M lb & up *dd add $1.00 cwt boxing. *ee 4 tons & up *ff 26 ga *gg add $2/cwt boxing; $0.75/cwt on skids *hh Theoretical wt for 48" x 96"; 60.4-lb. per sh *ii 300-bag lots *jj 100-lb bag *mm Theoretical wt; 19.7-lb per sh. *nn 2% cash *oo skid packed *pp type 304 *R revised.



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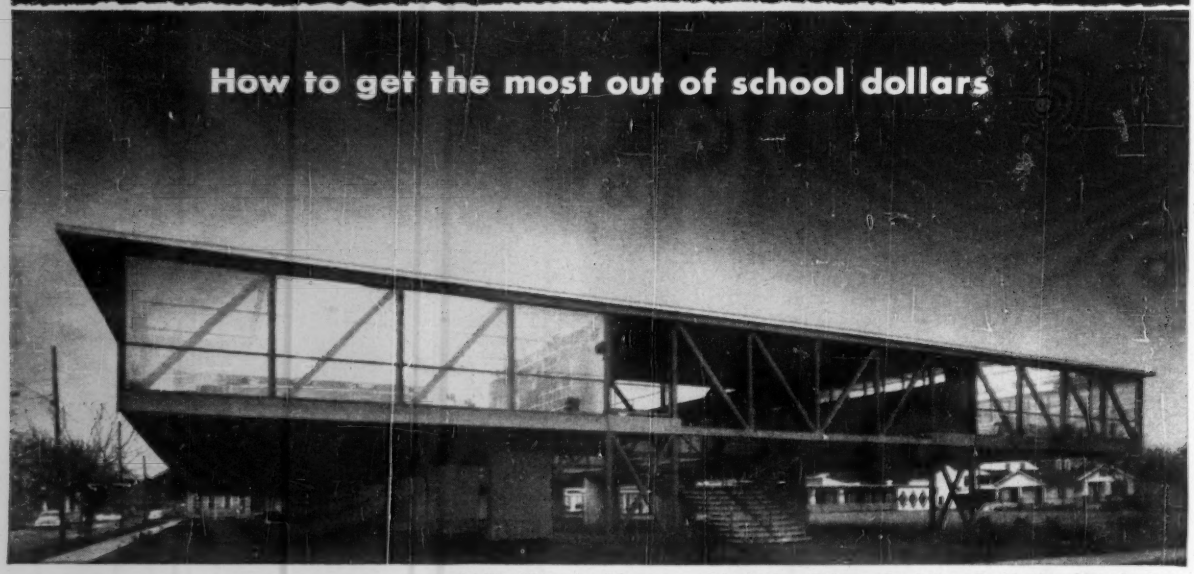

Phillis Wheatley Elementary School, New Orleans, Louisiana; B. M. Dornblatt & Assoc., Consulting Engineer; Charles R. Colbert, Architect; The Keller Construction Co., Contractor.

. . . unusual elevated design saves land welded construction cuts steel cost 15%

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J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, D. TARTAGLIA, Reports
I. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BUILDINGS—BA

R. I., Warwick—SCHOOL—BA 6/26—Rev. Russell J. McVinney, DD, Bishop of Providence, Chancery Office, Fenner St., Providence, Bishop Thomas Hendrickson Catholic High School between West Shore Road and Warwick Ave. $800,000. Plans deposit $50. Charles A. Maguire & Associates, Turks Head Bldg., Providence, R. I., Engrs. CD 11/29.

Vt., Middlebury—HOSPITAL—BA 7/7—Porter Hospital, Richard C. Hubbard, chmn. Planning Comn., South St., hospital addns. and alterations. $400,000. Helge Westermann, 41 E. 42nd St., New York City, N. Y., archt. R. G. Vanderweil, 9 Newbury St., Boston, Mass., mechanical engrs. CD 12/23.

▲ R. I., Kingston—CLASSROOM—BA 7/10—State R. I. & Prov. Plants, Div. Purchase, State House, Providence, Bid No. 1-R.I. Contr. RI Proj. URI-43 classroom bldg. University of R. I. $1,000,000. Charles A. Maguire & Assoc., Turks Head Bldg., Providence, archts. CD 11/9/56.

BUILDINGS—LB & CA

▲ White Constr. Co., Inc., 376 Boylston St., Boston, Mass., CA $2,104,534, est. $2,008,000, U-802 Contr. 1-LIBERAL ARTS CLASSROOM for University of Massachusetts, AMHERST, MASS. Commonwealth of Mass., c/o Div. Bldg. Constr., 38 Chauncy St., Boston, Mass. Bids May 21. CD 5/23, under LB.

▲† The Ferber Co. and A. Kaplen & Son, Ltd., 16 Johnson Ave., Hackensack, N. J., LB $4,329,000, est. $4,500,000-$5,000,000, Capehart Family HOUSING, Westover Air Force Base, IFB 19-617-58-103, CHICOPEE FALLS, MASS. Base Procurement Officer, Offutt Air Force Base, Omaha, Neb. Bids June 12. CD 5/21.

▲ Torrabene Bros. Co., 170 Needham St., Newton Lower Falls, Mass., LB $1,203,000, est. $1,000,000, HIGH SCHOOL, Cedar and Whiting Sts., HANOVER, MASS. Town High School Bldg. Comn., Town Hall, Hanover, Mass. Bids June 12. CD 5/22.

▲ A. W. Sawyer Assocs., Blanchard Rd., Burlington, Mass., LB Est. $1,250,000, INDUSTRIAL BLDG. addn. off Baker Ave., WEST CONCORD, MASS. General Radio Co., 22 Baker Ave., West Concord, Mass. Bids June 6. CD 6/3.

▲ Edward C. Long, 1545 Stratford Ave., Bridgeport, Conn. Owner Builds. $3,380,000, 200 HOUSES, "Housatonic Knolls," Lake Lillinonah, BROOKFIELD and NEWTON, CONN.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

Pennsylvania—BA 6/27—State Dpt. Forests & Waters, 512 Education Bldg., Harrisburg, warehouse alterations, roadway track and yard work, Duquesne Pier, Port of Erie Development Proj. Erie Co. $250,000. Plans deposit $20. Parson, Brinckerhoff, Hall & Macdonald, 155 Broadway, New York City, N. Y., engrs. CD 10/28.

N. Y., New York—TRACK, etc.—BA 7/11—New York City Transit Auth., 370 Jay St., Brooklyn 1, track and contact rail changes south of 14th St. Station and at 17th St., Lexington-4th Ave. Line, IRT Div., Contr. T-132, Manhattan Boro. CD 8/31/45.

BUILDINGS—BA

Md., Marlboro—SCHOOL—BA 7/1—Prince George's Bd. Educ., Marlboro, Surrattsville high school, Clinton. Plans deposit $50. Walton & Maddon, 3510 Rhode Island Ave., Mt. Rainier, Md., archt.

Pa., Waymart—OCCUPATIONAL, REHABILITATIVE, etc. —BA 7/9—General State Auth., 18 and Herr Sts., Harrisburg, occupational, rehabilitative and recreational bldg. at Farview State Hospital. Price & Dickey, 18 S. Olive St., Media, archts. CD 3/7/57.

▲ Md., Baltimore—EMPLOYMENT BUILDING—BA 7/10 —State, Dept. Pub. Imprvts., 506 Park Ave., Baltimore, 6 story, 130x260 ft. brick, granite, concrete, steel employment security bldg., Area 12, near new State Office Bldg. $2,000,000. Plans deposit $100. Fenton & Lichtig, 2219 Maryland Ave., archts. Green & Associates, 220 E. Pleasant St., engr. CD 2/10.

▲ N. Y., Brooklyn—SCHOOL—BA 7/17—Bd. Educ., Bureau of Constr., 42-15 Crescent St., Long Island City Zone 1, general constr., plumbing and drainage, heating and ventilating, electrical work and lighting fixtures for Public School 146, Clermont Ave. and Adelphi St. between Myrtle and Park Aves., Brooklyn Boro. $2,421,000. Plans deposit $25, for general $10. Each for trades. CD 7/23.

HEAVY CONSTRUCTION—LB & CA

▲ D. W. Winkelman, Inc., 205 Harrison, Syracuse, N. Y., CA $5,122,296, general constr. flow units for Hiawatha Treatment plant, SYRACUSE, N. Y. Metropolitan Syracuse Treatment Plant Dist., Onondaga Co., County Office Bldg., Rm. 102, 600 South State St., Syracuse, Zone 2, N. Y. Bids Apr. 18. CD 4/22, under LB.

Pangia Constr. Co., Atco, N. J., CA $149,389, Haddon Ave. reconstr., Haddonfield, CAMDEN, N. J., Camden Co. Bd. Freeholders, Court House, Camden, N. J., William Cattell, co. engr., CD 5/1/51.

▲ PENNSYLVANIA—Pa. Hy. & Bridge Auth., 506 North Office Bldg., Harrisburg, bids opened 6/13. Dinardo Inc., 331 Bouquet St., Pittsburgh 13, Pa. LB $2,385,242. widening and constr. 41,811 ft. roadway with crushed aggreg. base and bit. surf. variable in width 4 lane divided hy. bridge over Pine Creek. T. R. 8 (Proj. 703-1) Shaler and Hampton Twps., Etna Boro. Allegheny Co. CD 5/23.

▲ Driscoll Constr. Co., Inc., 1121 Frankford Ave., Phila., Pa. CA $906,102 Bid 2021, reconstr. sewer and relay of water mains in Moore St. between Delaware Ave. and 7th St., PHILA., PA. Dpt. Procurement, City Hall Annex, Phila., Pa. Grand total $1,490,-179. Bids May 27, CD 5/15.
D&C Spinosa Co., 2-8 N. Jerome St., Allentown, Pa. CA $297,012, Bid 2022, sewer and grading in 18th St. from Packer Ave. to Geary St. and other locations. (Phila., Pa.);
Miniscalco Bros., 5927 N. Ella St., Phila. 20, Pa. CA $94,418, Bid 2023, sanitary sewer and water main in City Ave. (Seaside) from Monument Rd. to Belmont Ave. (Phila., Pa.);
Marino Masse, Inc., 4418 N. American St., Phila., Pa. CA $114,712, Bid 2024-25 sewers, (Phila., Pa.);
F. Leva, 6521 N. 4th St., Phila., Pa. CA $77,932, Bids 2028-29 sewers (Phila., Pa.)

▲ Hughes-Foulkrod Co., 1505 Race St., Phila., Pa. CA $1,190,132, Bid 2009 Torresdale Filter Plant, concrete conduit and appurtenant work, PHILA., PA. Dpt. Procurement, City Hall Annex, Phila., Pa. Bids May 6 (Correction—Contractor) CD 6/2, under CA.

BUILDINGS—LB & CA

▲ Knickerbocker Constr. Co., 3 E. 54th St., New York 22, N. Y., CA $6,000,000, structural concrete forms, superstructure for Seward Park Houses, East Broadway, Grand St. and Pitt St., NEW YORK, N. Y. United Housing Foundation Inc., 11 W. 42 St., New York 36, N. Y. CD 9/12/56.

BUILDINGS—LB & CA

▲ H R H Constr Corp., 16 W. 46 St., New York 19, N. Y., LB $15,363,000 (5 bidders), general contract Luna Park HOUSES (Proj. NYC-34), in area of Neptune Ave., W. 8th St., Surf and Stillwell Aves., Brooklyn Boro, BROOKLYN, N. Y. New York City Housing Auth., 299 Broadway, New York, Zone 7, N. Y. Bids June 3. CD 10/10/56;
Fein-Schlosberg, Inc., 1770 Second Ave., New York 28, N. Y., LB $1,437,000 (11 bidders), plumbing (Brooklyn, N. Y.);
AFGO Engr. Corp., 475 Adelphi St., Brooklyn 17, N. Y., LB $1,195,000 (7 bidders), heating (Brooklyn, N. Y.);
Herman H. Schwartz, Inc., 179 So. Portland Ave., Brooklyn 17, N. Y. LB. $968,450 (12 bidders), electric (Brooklyn, N. Y.).

▲ Cadillac Builders, Inc., c/o Frank Schwartz, Rte. 130, Burlington, N. J., Separate contracts, $1,500,000, 75 unit RESIDENTIAL DEVELOPMENT, Lawrence Rd., Lawrence Twp., TRENTON, N. J., Lester Weskesser, 19 Montana Ave., Erlton, N. J., archt.

SOUTH

HEAVY CONSTRUCTION—BA

Fla., Miami—BA 7/2—City Comm., Municipal Justice Bldg., 1145 N.W. 11 St., Point Sanitary Sewer Improvement SR-5064 S & C. Plans deposit $10 City Engr. Dpt., 3332 Pan American Dr., engr. CD 6/28/57.

† Louisiana—BA 7/10—U. S. Eng., P. O. Box 60, Vicksburg, Miss., constr. approx. 377,000 cu. yd. earthwork and placing approx. 210 cu. yd. grav. road surf. on west bank of Mississippi River, East Carroll Parish.

† Louisiana—BA 7/15—U. S. Eng., foot of Prytania St., New Orleans, 200,000 cu. yd. embankment and 10 acres seeding on Allendale levee setback, Inv. No. 58-319, West Baton Rouge Parish. CD 4/24/44, under Illinois-Louisiania.

BUILDINGS—BA

Ga., Cairo—HOSPITAL—BA 7/10—Grady County Hospital Auth., Court House, Grady Community Hospital, Proj. GA 221, $495,000. Plans deposit $50. Thomson Lackey & Assocs., 105 East Ann St., Valdosta, archts. CD 9/26.

HEAVY CONSTRUCTION—LB & CA

† Anderson-Gregory, Co., Inc., Sudekum Bldg., Nashville, Tenn., Burns Contracting Co., 16th Ave. S., Nashville, Tenn., Wallace Constr. Co., Elizabethtown, Ky. CA $3,126,702, joint bid. 10,000 ft. jet runway at Berry Field, 8,000 ft. with 1,000 ft. of overrun at each end. NASHVILLE, TENN. City of Nashville and National Guard Bureau Andrews Air Force Base, Camp Springs, Md. Awarded June 6. CD 5/8, under LB.

▲† Hyde Constr. Co., 1804 N. Mill, Jackson, Miss., LB $5,237,637 (alternate) $6,841,152, runway and parking area pavement and utilities, U. S. Naval Air Station, NBy 13944, MERIDIAN, MISS. Dist. P. Wks. Office, Sixth Naval Dist., Bldg. No. 13, U. S. Naval Base, Charleston, S. C. Bids June 10. CD 5/21.

BUILDINGS—LB & CA

▲ Pattillo Constr. Co., Box 570, Decatur, Ga., LB $1,184,113, FACTORY and OFFICE BLDG., ATLANTA, GA. Dan Neal Corp., c/o Bodin & Lamberson, archts. 827 Forsyth Bldg., Atlanta, Ga. Bids June 5. CD 5/23.

▲ Allen M. Campbell Co., Box 386, Tyler, Tex., CA $1,599,000, Proj. FLA 8-CS-14 (D), COLLEGE HOUSING MEN'S DORMITORY, Florida State University, TALLAHASSEE, FLA. State Bd. Control, Education Bldg., Florida State University, Tallahassee, Fla. Bids May 22, CD 5/28, under LB.

▲† J. D. Hedin Constr. Co. 2900 Newton St. N. E., Wash. D. C., CA $1,242,300 constr. BACHELOR OFFICERS QUARTERS with mess, 150 officers at Marine Corps Schools, NBy 11388, QUANTICO, VA. Dist. P. Wks. Office, Potomac River Naval Command, Navy Gun Factory, Wash. D. C. Bids June 4, awarded June 11. CD 6/6, under LB.

W. E. Dale Constr. Co., Morganton, N. C., CA $507,000, 74,000 sq. ft. HIGH SCHOOL, BREVARD, N. C. Transylvania County Bd. Educ., Brevard, N. C. Bids Apr. 24, CD 5/12, under LB.

▲ Winchester Constr. Co., 828 Baker St., Tallahassee Fla., LB $951,811, 7 story, 95 x 179 ft. CB-brick RIC, COLLEGE HOUSING (Womens Dormitory), FLA 8-CH-14 (D) Florida State University, TALLAHASSEE, FLA. State Bd. Control, Education Bldg., Florida State University, Tallahassee, Fla. Bids June 5, CD 5/12.

HEAVY CONSTRUCTION—LB & CA

▲ D. W. Winkelman, Inc., 205 Harrison, Syracuse, N. Y., CA $5,122,296, general constr. flow units for Hiawatha Treatment plant, SYRACUSE, N. Y. Metropolitan Syracuse Treatment Plant Dist., Onondaga Co., County Office Bldg., Rm. 102, 600 South State St., Syracuse, Zone 2, N. Y. Bids Apr. 18. CD 4/22, under LB.

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Miniscalco Bros., 5927 N. Ella St., Phila. 20, Pa. CA $94,418, Bid 2023, sanitary sewer and water main in City Ave. (Seaside) from Monument Rd. to Belmont Ave. (Phila., Pa.);
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PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England	**Middle West**
Middle Atlantic	**West of Mississippi**
South	**Far West**

PROPOSED WORK

Water Supply	**Public Buildings**
Sewers, Waste Disposal	**Mass Housing**
Bridges	**Commercial Buildings**
Streets & Roads	**Industrial Buildings**
Earthwork, Waterways	**Unclassified**

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.
CD dates shown are of Construction Daily issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Construction Daily

For additional reports see Construction Daily.

HARDWARE

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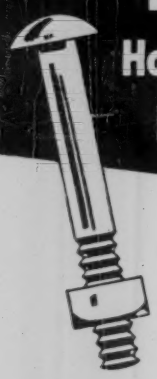

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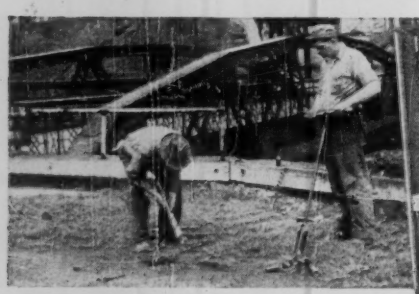

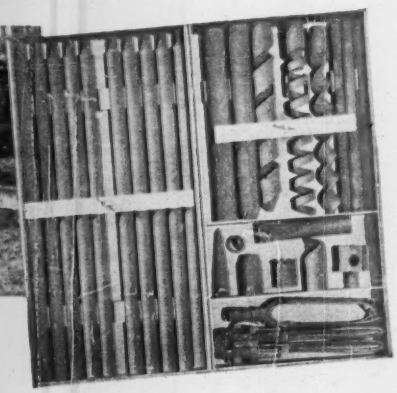

Acker Soil Sampling Kit being used for test borings for bridge foundation. Over 30 years of soil sampling experience make this Acker kit the most useful you can buy!

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MIDDLE WEST

HEAVY CONSTRUCTION—BA

† Wis., Madison—REFUELING MAINTENANCE—BA 6/23—Base Procurement Office, Bldg. 600, Truax Field, Madison, Zone 7, modification of refueling maintenance, Truax Field, IFB 47-602-58-126, Proj. WO 58-399, Extended date, CD 5/28.

† Wis., Madison—OFFICERS' MESS BLDG NO. 1507—BA 6/23—Base Procurement Office, Bldg. 600, Truax Field, Madison, Zone 7, equipment and utilities installation in Officers' Mess Bldg. 1507, Truax Field, IFB 47-602-58-125, Proj. W. O. 58-401, Extended date CD 5/28.

† Wis., Madison—AIR FIELD IMPRVS—BA 6/24—Base Procurement Office, Bldg. 600, Truax Field, Madison, Zone 7, security fencing, protective lighting and roadway around Rocket Storage Area, Bldgs. 1210 and 1212, Truax Field, IFB 47-602-58-123, Proj. No. W. O. 58-395 and 396, Extended date, CD 5/28.

† Wis., Madison—SAGE BLDG.—BA 6/25—Base Procurement Office, Truax Field, Madison, Zone 7, modification of Room 122A, Sage Bldg. No. 2111, Truax Field, IFB 47-602-58-132, Proj. No. W. O. 58-400, Extended date, CD 6/3.

BUILDINGS—BA

Ill., Wauconda—BA 7/1—School Dist. 86, Osage St., 1 story, brick school addn. Osage St.-Larkdale Subd. $400,000. Raymond A. Orput & Assoc., Empire Bldg., Rockford, archts. CD 11/14.

Ill., Skokie—BA 7/9—Cleveland Middleton School Dist. 73½, 8145 Kildare Ave., 2 story, brick Junior High School, Oakton St. between E. Prairie Rd. and Crawford Ave. $600,000. Raymond A. Orput & Assoc., Empire Bldg., Rockford, archts. CD 1/7.

HEAVY CONSTRUCTION—LB & CA

▲ INDIANA—State Hy. Comn., John Peters, chn., State House Annex, Indianapolis.

Ralph Myers Cont. Corp., Salem, Ind., CA $1,531,915, est. $1,748,889, reinforcing steel, 5.544 mi. SR 62, Proj. F-845(8), Contr. R-4302, Posey Co. Bids Mar. 25, CD 3/31, under LB.

▲† The Tri-State Constr. Co., Inc., 3100 East 56 St., Indianapolis, Ind., CA $2,912,373, constr. of airfield paving at the Bunker Hill Air Force Base, NBy-12738, PERU, IND., Dist. P. Wks. Office, Ninth Naval Dist., Bldg. 1-A, Great Lakes, Ill., Bids May 16, CD 4/23.

▲† S. J. Groves & Sons Co., 500 Wesley Temple, Minneapolis, Minn., CA $13,606,998, constr. runway and taxiway at Richard I. Bong Air Force Base, ENG-11-032-58-6, KANSASVILLE, WIS. U. S. Eng., 475 Merchandise Mart, Chicago 54, Ill., Bids June 5, awarded June 12, CD 6/10, under LB.

BUILDINGS—LB & CA

▲ F. A. Wilhelm Constr. Co., Inc., 3914 Prospect St., Indianapolis, Ind., CA $2,726,081, SCHOOL of Music bldg., addn. and alterations, BLOOMINGTON, IND., Bd. Trustees, Indiana University, Bloomington, Ind., Bids Mar. 20, CD 4/21, under LB.

WEST OF MISSISSIPPI

BUILDINGS—BA

▲ Minn., Hopkins—SCHOOL—BA 7/9—Bd. Educ., R. R. Child, clk., junior high school. $1,700,000. Plans deposit $50. Bissell & Belair, 1211 Nicollet Ave., Minneapolis, Minn., engrs. CD 11/20.

▲ Mo., Columbia—FINE ARTS CENTER—BA 7/10—Curators of University of Missouri, Dale O. Bowling, bus. mgr., 116 Jesse Hall, Columbia, fine arts center on Hitt St. between University Ave. and Lowry St. $2,800,000. Plans deposit $25. Hellmuth, Obata & Kassabaum, Inc., 315 N. 10th St., St. Louis 1, Mo., archts. CD 12/21/56.

▲ Mont., Bozeman—RESIDENCE HALL—BA 7/14—State Bd. Educ., Helena, 3 story split level, H-shaped, women's residence hall at Montana State College. $1,250,000. Plans deposit $50. Cushing, Terrell & Associated Architects, 1333 Airport Rd., Billings archts. CD 9/9/55.

HEAVY CONSTRUCTION—LB & CA

▲ F. R. Comb Co., 2901 Aldrich Ave. South, Minneapolis, Minn., LB $2,950,000 (9 bidders), (1) engine bldg., boiler plant, water reservoir; (2) stores and shops bldg. for Northwest Airlines Main Base at Wold-Chamberlain Field, MINNEAPOLIS, MINN. Minneapolis-St. Paul Metropolitan Airports Comn., 2429 University Ave., St. Paul, Minn. Bids June 11 CD 5/5,

▲ N. F. English Constr. Co., 601 E. 2nd St., Hutchinson, Kan., CA $1,346,800 Est. $1,472,880-section 1-sanitary sewage treatment plant proper, HUTCHINSON, KAN. City, C. H. Ash, city clk., City Hall, Hutchinson, Kan. Bids May 29 CD 5/12.

OKLAHOMA—State Hy. Dpt., Capitol 5, Oklahoma City, cancelled bids to have been opened June 3, grading, drainage 6.921 mi. Hy. 100 from Stilwell north to Arkansas State Line, Adair Co.; $386,000, CD 5/28.

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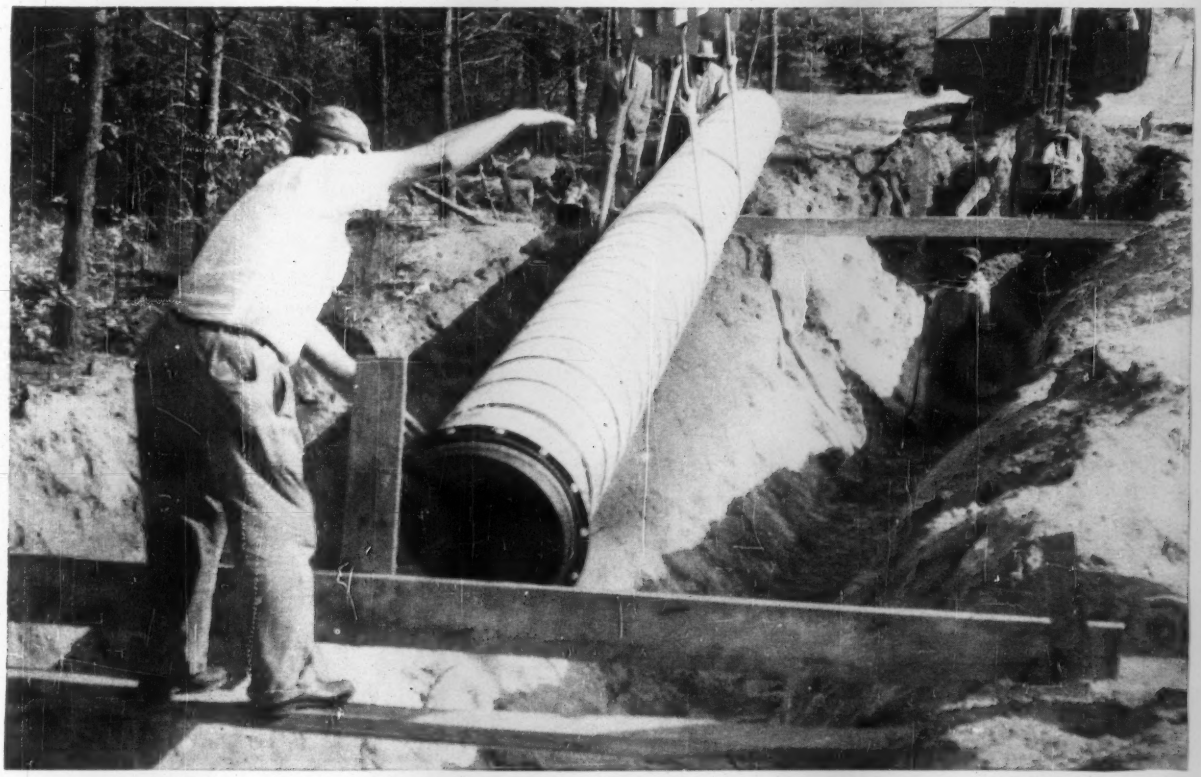

Lenoir, North Carolina engineered this 10-mile, 20-inch water supply line to supply an additional 3 mgd. Gilbert Engineering and Pat O. Chester Construction Co. laid the 100 per cent Dresser-Coupled steel piping in 40 and 50 foot lengths.

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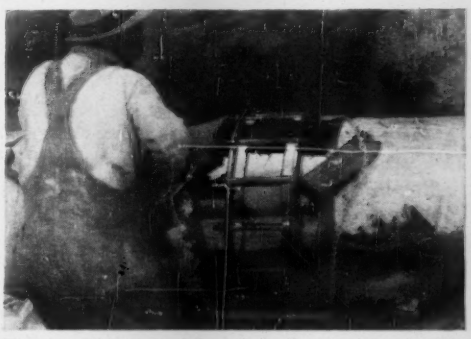

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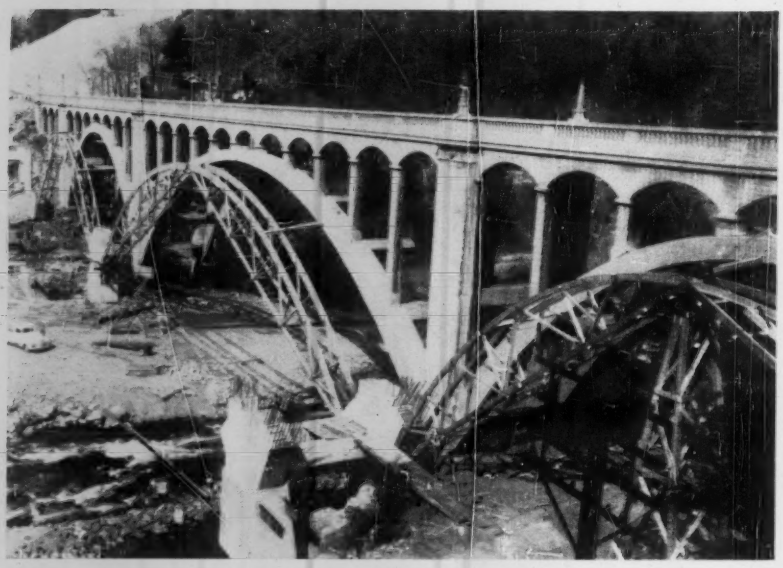

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▲† H. B. Zachry Co., Construction Div., Box 10188, San Antonio, Tex. LB $1,346,000, taxiway and shoulder pavements, and demineralized water sys. Biggs Air Force Base, ENG-29-005-58-124, EL PASO, TEX. U. S. Eng., Box 1538, Albuquerque, N. M. Bids May 28. CD 5/6.

† Empire Elec. Co., Inc., P. O. Box 590, Fort Worth, Tex. LB $82,503 est. $79,341 constr. ILS facility, at Carswell Air Force Base, ENG-41-443-58-64, FORT WORTH, TEX. U. S. Eng., 100 W. Vickery, Fort Worth, Tex. Bids June 10. CD 5/16.

▲ Joe Bland Constr. Co., Box 1158, Austin 64, Tex. CA $1,162,002, water distr. sys. LEANDER, TEX. Travis-Williamson County Water Control & Imprvt. Dist. No. 1, David N. Tisinger, pres., Courthouse, Austin, Tex. Cameron Eng. Co., 604 W. Aves, Austin, Tex. engr. Bids May 28.

† Brown & Olds, Box 8125, Station C, Albuquerque, N. M., LB $251,738, sewage disposal plant expansion, Holloman Air Force Base, ENG-29-005-58-119, ALAMOGORDO, N. M., U. S. Eng., Box 1538, Albuquerque, N. M., Bids May 26, CD 4/23.

BUILDINGS—LB & CA

▲ G. J. Grant Constr. Co., Como Ave. & N. P. Tracks, St. Paul, Minn., LB $1,157,500 (12 bidders), BIO-MEDICAL LIBRARY and ANIMAL RESEARCH LABORATORY on Campus, MINNEAPOLIS, MINN. Regents of the University of Minnesota, C. A. Smith, purch. agt., 404 Administration Bldg., Minneapolis 4, Minn. Bids June 10. CD 5/16.

▲† Brown & Root Inc., Box 3, Houston, Tex. CA $2,987,785 POLYSULFIDE PROPELLANT FACILITIES (3 bldgs. and remodel a 4th) at Longhorn Ordnance Works Karnack near MARSHALL, TEX. U. S. Eng., P. O. Box 867, Little Rock Ark. CD 6/10, under LB.

▲ Burns Constr. Co., Burns Vault Bldg., Denver, Colo., Owner Builds, $4,000,000, 1 story and bsmnt., 300 RESIDENCES, ADAMS CITY, COLO.

▲ Hutchinson Constr. Co., 2896 S. Sheridan Blvd., Denver, Colo., Owner Builds, $1,300,000, constr. 1 story 3 and 2 bedrooms, 87 RESIDENCES, (filing 3,) Arvada West Subdivision, Jefferson Co., ARVADA COLO.

▲ Hutchinson Constr. Co., 3806 S. Sheridan Blvd., Denver, Colo., Owner Builds, $1,250,000, 1 story 80 RESIDENCES, Arvada West Subdivision, 6200 Block on Ralston Rd., (Filing 2) ARVADA, COLO.

FAR WEST

BUILDINGS—BA

▲ Calif., San Luis Obispo—RESIDENCE HALLS, etc.—BA 6/25—State Div. Architecture, 1100 S. Grand Ave., Los Angeles; six 3 story, 233,000 sq. ft. floor area rein.-brick and masonry and concrete student residence halls and site development work at California State Polytechnic College. W. O. 4005GC-28 and 25. $3,898,550. Plans deposit $100. Extended date. CD 5/23.

HEAVY CONSTRUCTION—LB & CA

Inland Asphalt Co., Box 4116, Station B, Spokane, Wash., CA $90,117, (2 bidders), b. conc. paving, COEUR D'ALENE, IDAHO. City, City Hall, Coeur d'Alene, Idaho.

Intermountain Constr. Co., 1322 Grove St., Boise, Idaho, CA $245,152, relief sewer lines, MOSCOW, IDAHO, City, City Hall, Moscow, Idaho. Bids May 1. CD 5/19, under LB.

▲† Morrison-Knudsen Co., Box 450, Boise, Idaho, CA $3,344,413, air field alert apron, taxiways, Mountain Home Air Force Base, ENG-45-164-58-51, MOUNTAIN HOME, IDAHO, U. S. Eng., City-County Airport, Walla Walla, Wash. Bids May 20, awarded May 29. CD 5/23, under LB.

† Procurement Officer, Paine Air Force Base, Wash., cancelled bids to have been opened June 13, taxiway lighting, Paine Air Force Base, Inv. 58-102, EVERETT, WASH. CD 6/3.

▲ CALIFORNIA—State Div. Hys., 120 S. Spring St., Los Angeles. Bids opened 6/12,

Peter Kiewit Sons Co., 345 Kieways, Arcadia, Calif. LB $8,394,835 (8 bidders) 4.1 mi. 8 lane freeway on Ventura Freeway, U.S. Hy. 101 between Laurel Canyon Blvd. and interchange at Jct. with San Diego Freeway, incl. 15 bridges. VII-L.A.-2 158-L.A., Los Angeles Co. CD 5/8.

▲ CALIFORNIA—State Div. Hys., 1120 N. St., Sacramento. Bids opened 6/11,

Charles Macclosky Co., 15900 S. Broadway, Gardena, Calif. LB $1,062,522 (6 bidders) constr. 1.3 mi. 4 lane freeway and 4 structures U.S. Hy. 101 through Arroyo Grande V-SLO-2, ARGD San Luis Obispo Co. CD 5/14.

▲ A. S. Holmes & Son, Inc., 9300 "G" St., San Francisco, Calif. CA $2,000,000, 175,000 sq. ft. INDUSTRIAL PLANT for mfg. chain, ALVARADO, CALIF. The Campbell Chain Co., 415 Norway St., York, Pa. Robert S. Holmes, c/o contractor, engr. CD 6/6.

E. T. Haas, Box 95 Belmont, Calif. LB $95,925 (9 bidders) sewer constr. (pipe, manholes, appurtenances) BELMONT, CALIF. City, City Hall, Belmont, Calif. Raymond F. Murphy, 650 El Camino Real, Redwood City, Calif., engr.

▲ Utah Dredging Co., 100 Bush St., San Francisco, Calif. LB $2,596,250 Section A, diking, dredging and fill at piers "F" and "G" Long Beach Outer Harbor,

Exclusive "K&M" FLUID-TITE Coupling is permanently water-tight, with self-energizing rubber coupling rings. Unskilled labor can assemble it in any weather, without the use of heavy machinery. It allows deflection up to 5°.

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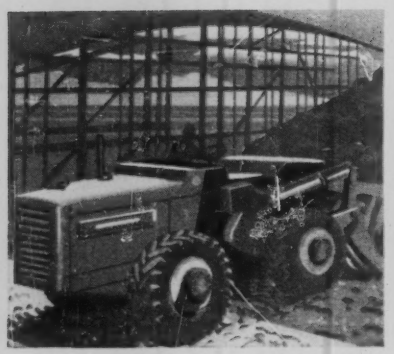

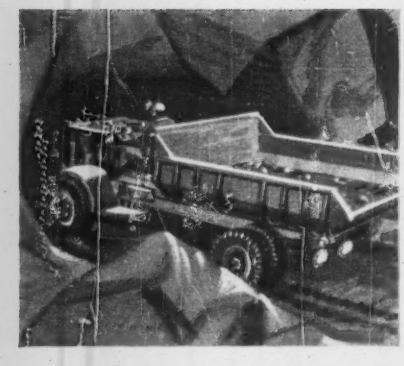

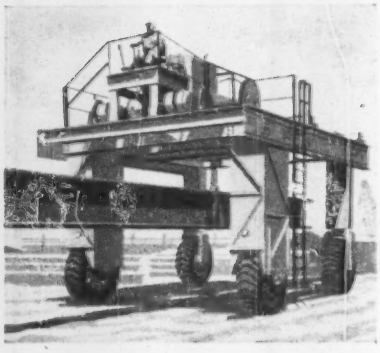

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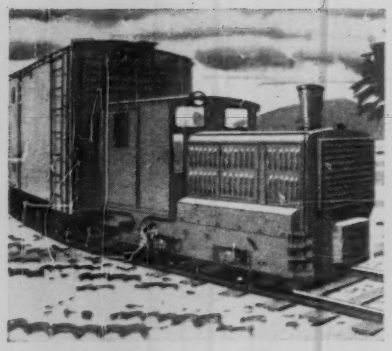

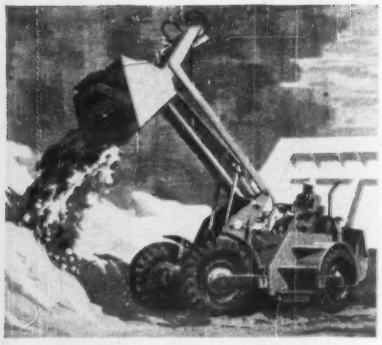

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This versatile, full-power shift transmission has proved it is a "must" in the 70 to 140 horsepower field—up to 300 foot pounds net torque input. A completely integral torque-converter-full-power shift package provides engine torque multiplication in the converter up to 350%, plus three forward and three reverse gear selections that were particularly designed to give maximum performance for these types of service.

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The CRT-3331 is an engineered power train combining the best thinking of our manufacturing customers plus our own ten years' experience in the field.

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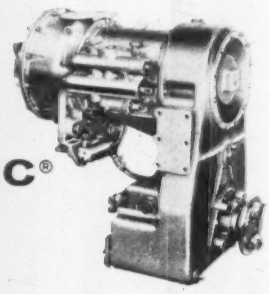

ALLISON DIVISION OF GENERAL MOTORS, Indianapolis 6, Indiana

Allison TORQMATIC® DRIVES

Spec. HD 526, LONG BEACH, CALIF. Long Beach Harbor Dpt., 1333 Embarcadero, P.O. Box 570, Long Beach, Calif. Bids June 12. CD 5/19.

Graham Bros., 1512 W. 7th St., Long Beach, Calif. LB $2,542,500 Section B (Long Beach, Calif.)

Asbury Transportation Co., Triangle Rock Products Inc., 2222 E. 38th St., Los Angeles, Calif. CA $729,000. furnishing, placing dirt for dikes, Spec. HD 547, LONG BEACH, CALIF. Long Beach Harbor Dpt., 1333 E. Embarcadero, Long Beach, Calif. Bids May 27, awarded May 29. CD 6/3, under LB.

Marco Corp., 14409 Paramount Blvd., Paramount, Calif. LB $944,745, est. $1,500,000 (10 bidders) constr. Joint Outfall "B" Trunk Sewer, Units 9-B, Section 1 approx. 11,000 ft. 114 in. rein.-con. pipe, Davidson City, Dominguez, LOS ANGELES, CALIF. Los Angeles Co. Sanitation Dist. No. 2, 2020 Beverly Blvd., Los Angeles, Calif. Bids June 10. CD 5/19.

▲ Valley Engineers Inc., S. 99 Hy., and North Ave., Fresno, Calif. CA $1,332,162, constr. Granada Trunk Line Unit III, 29,801 ft. 48 in. steel water mains LOS ANGELES, CALIF. Los Angeles Dpt. Water & Power, 311 S. Spring St., Los Angeles, Calif. Bids May 6, awarded June 10. CD 5/9, under LB.

† The Pacific Co., 801 Cedar St., Berkeley, Calif. CA $506,838 NCO officer mess. Spec. No. 2410. ENG-04-167-58-48, TRAVIS AIR FORCE BASE, CALIF. U. S. Eng., 1209 8th St., Sacramento, Calif. Bids May 27, awarded June 5. CD 6/3, under LB.

Sondgroth Bros., Box 1055, Mountain View, Calif., LB $114,351, (1 bidder) street imprvs. (curbs, manhole, related work)* Bonita—Camille Imprvt. Dist., Santa Clara Co., MOUNTAIN VIEW, CALIF. City, c/o Clerk, City Hall, Mountain View, Calif. CD 1/20.

Vincent Maggiora & Son, P.O. Box 385, Sausalito, Calif., LB $84,668 (2 bidders) road reconstr. (over-laying of street, reconstr. drainage structures, curbs, gutters, etc., Proj. 58-4, Marin Co., SAN RAFAEL, CALIF. City, City Hall, San Rafael, Calif. CD 5/15/57.

▲ Frazier-Davis Constr. Co., 1319 Mackland Ave., St. Louis 10, Mo. CA $5,175,135 constr. 4 mi. 14 ft. diameter tunnel for Upper American Proj. SACRAMENTO, CALIF. Sacramento Municipal Utility Dist., 2101 K St., Sacramento, Calif. Bids June 3, awarded June 12. CD 6/5, under LB.

BUILDINGS—LB & CA

▲ Teyssier & Teyssier, 1357 7th Ave., San Diego, Calif. LB $1,111,509 (8 bidders) LABORATORY BLDG. Pt. II at the Scripps Institute of Oceanography LAJOLLA, CALIF. University of California at Scripps, La Jolla, Calif. Bids June 12. CD 5/21.

† Louis C. Dunn Constr., Inc., 681 Market St., San Francisco, Calif. LB $890,200. 2 story, 80,000 sq. ft. rein.-con. U. S. Geological SURVEY BLDG., MENLO PARK, CALIF. General Services Admin., 49-4th St., San Francisco, Calif. Bids June 10. CD 5/26.

▲ Steed Bros., 714 Date Ave., Alhambra, Calif. LB $1,641,900. (6 bidders) general constr. four 4 story, 155,500 sq. ft. floor area brick masonry, concrete student RESIDENCE HALLS at Kellogg-Voorhiss Campus, California State Polytechinic College, POMONA, CALIF. State Div. Architecture, 1100 S. Grand St., Los Angeles, Calif. Bids June 11. CD 5/16;
Hickman Bros., 3170 E. 11th St., Los Angeles, Calif. LB $388,200 (7 bidders) mechanical work (Pomona, Calif.).

Marine Developers, Inc., 2170 Avenida del la Playa, La Jolla, Calif. CA $915,308, 98 frame stucco DWELLINGS, Constitution, Jamestown and Rebel Rds., SAN DIEGO, CALIF. Heritage Homes Inc. No. 2, Box 1122, La Jolla, Calif.

A. J. Peters & Son, 534 Stockton Ave., San Jose 4, Calif. LB $414,000 (4 bidders) combined mechanical work for INDUSTRIAL ARTS BLDG. at San Jose State College, W. O. 4005GC-44, SAN JOSE, CALIF. State Div. Architecture, 1120 N. St., Sacramento, Calif. Bids June 10. CD 5/16.

The Austin Co., 16112 Euclid St., Cleveland, O., CA Est. $235,000, WAREHOUSE addn., SEATTLE, WASH., Mayflower Corp., 2713 3 Ave., Seattle, Wash.

† Harris Constr. Co., P.O. Box 109, Fresno, Calif., LB $365,000 (4 bidders) Wing Group BLDG. at Air National Guard Base Terminal, NG 58-13, FRESNO, CALIF. Dpt. Army & Air Force National Guard, P.O. Box 1139, Sacramento, Calif.

John Edwin, Frank Murphy, 3701 E. Foothill Blvd., Pasadena, Calif. Owner Builds. $863,800, 2-story, 223,570 sq. ft. steel deck SHOPPING CENTER, Rosemead and Foothill Blvd., PASADENA, CALIF.

PROPOSED PROJECTS

WATER SUPPLY

N. Y., Hamburg—Hamburg Central Water Dist., Town Hall, 250,000 gal. storage tank, water mains, meters and service lines to serve approx. 1,000 residential users. $851,000.

SEWERS, WASTE DISPOSAL

Kan., Pratt—City, City Hall, bond Election Aug. 5, sewage treatment plant and auxiliaries $383,000. Wilson & Co., 631 E. Crawford St. and P. O. Box 28, Salina, consult. engrs. CD 4/16/56.

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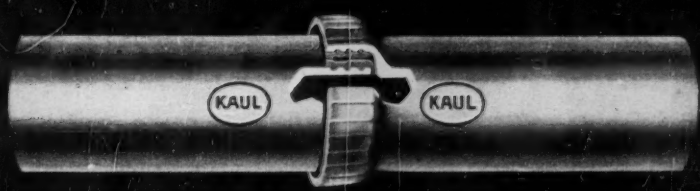

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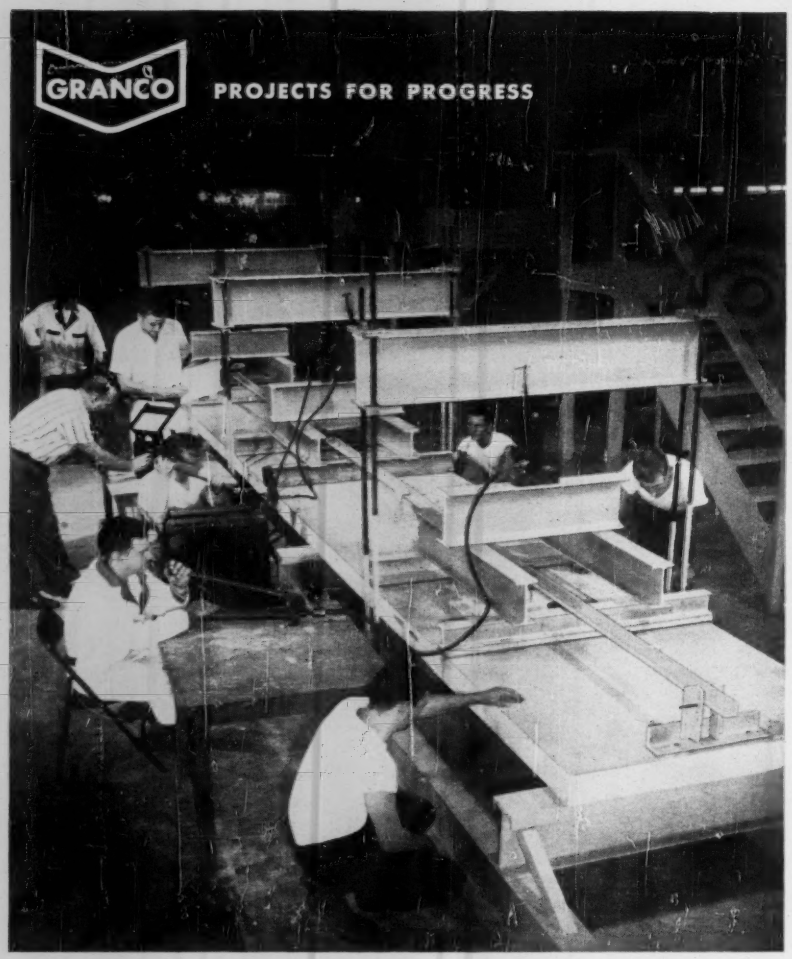

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The 130-square foot floor system consisted of a structural concrete slab—formed and reinforced with 1) Cofar steel units, and 2) E/R Cofar units containing UL listed electrical raceways. Header ducts and junction boxes were attached to E/R Cofar units at the region of maximum moment.

As hydraulic jacks applied increasing pressure, sensitive gages measured stress and strain. Cofar and E/R Cofar units work together to support the load. In this test, the floor supported a 170-psf design load. Finally—at *6.8* times design load—the slab failed.

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SINCE 1878 GRANITE CITY STEEL

Pa., Warminster—Warminster Twp. Municipal Auth., sewage disposal plant. $150,000. Oscar Corson, Ambler, Pa., consult. engr.

BRIDGES

▲ Ont., Cornwall—St. Lawrence Seaway Auth., No. 2 Temporary Bldg., Ottawa, high level bridge over North Channel of St. Lawrence River, north end and Cornwall Island, south end of bridge. $6,000,000.

PUBLIC BUILDINGS

▲† Calif., Concord—GUIDED MISSILE FACILITIES—Dist. Pub. Wks. Office, 12th Naval Dist., Room C112, San Bruno, Calif., guided missile support facilities at Concord Naval Ammunition Depot. $2,000,000.

▲ D. C., Wash.—NATIONAL ARBORETUM HEADQUARTERS IMPRVS.—General Services Admin., 18th & F Sts., N.W., Wash., D. C., plans by Deigert & Yerkes, 3205 N St., N.W., Wash., D. C., Office Laboratory unit, a herbarium for dried-plant collections and an auditorium, for the National Arboretum Headquarters. $1,130,000. CD 10/26/45.

▲ N. Y., Elmsford—SCHOOL—School Dist. No. 9, Hillside Ave., voted $1,075,000, elementary school and addn. to Alexander Hamilton high school. Knappe & Johnson, 2 Overhill Rd., Scardsale, N. Y., archts. CD 4/10.

▲ O., Berea—SCHOOL—Berea Bd. Educ., 390 Fair St., Berea, O., Junior High School. $2,350,000. CD 11/9/56.

▲ O., Fairfield—SCHOOL—Bd. Educ., Fairfield, O., plans by Fred Winkler, First National Bank Bldg., and Robert Beechly, 28 Avon Drive, both Hamilton, O. high school. $1,388,000.

COMMERCIAL BUILDINGS

▲ Calif., Palo Alto—COTTAGES, APARTMENTS, etc.—Northern California Presbyterian Homes Inc., 593 Market St., San Francisco, plans by Rolland B. Hammond, San Rafael, cottages, apartments, central recreational facility on 40 acre site. $3,500,000. Bids in Sept. or Oct.

▲ Calif., San Francisco—APARTMENT HOUSE—Callan Constr. Co., 2790 Junipero Serra, Daly City, plans by Angus McSweeney, AIA, 2960 Van Ness Ave., apartment house proj., at Lake Merced and Sky Line Blvd. $10,000,000. CD 6/4.

▲ Conn., New Haven—APARTMENT—University Towers, Inc., 370 Lexington Ave., New York, N. Y., plans by Kahn & Jacobs, 2 Park Ave., New York, N. Y., three 16 story, bldgs., Apartment Bldgs., Oak St. Redevelopment Area, $8,500,000. Bids for 1st bldg. in 1958, Garfinkel & Marenberg, 100 W. 42nd St., New York, N. Y. consult. engrs. Fred. S. Dubin Assocs., 312 Seventh Ave., New York, N. Y. electrical engrs. Barstow, Mulligan & Vallmer, 49 W. 45th St., New York, N. Y. site engs. CD 4/4/58.

▲ Conn., West Hartford—HOTEL—William A. Mauser, 345 North Main St., West Hartford, plans by Kane & Fairchild, 734 Asylum Ave., Hartford, 6 story, Cotillion Hotel, Albany Ave., swimming & wading pools, 1 story cabana, putting green. $3,000,000.

▲ Fla., Pensacola—HOUSING—Wedgewood Corp., Walter K. Dean, Pres., 6200 Mobile Hy., Pensacola, Fla., 1,000 homes for Negroes; shopping center, lake, recreation facilities. $10,000,000.

▲ Neb., Lincoln—SHOPPING CENTER—Bankers Life Ins. Co., 14th & N., plans by Lobel, Schlossman, & Bennett, 333 N. Michigan, Chicago, Ill. archts. Gateway Shopping Center, Dept. Store, auto bldg. parking and 25 other units. $4,000,000.

▲ Tenn., Nashville—APARTMENT—Capitol Towers, Inc., c/o John H. Doggett, archt, 2916 Park Ave., Memphis 11 story 188 unit apartment in Capitol Hill redevelopment area. $2,000,000.

▲ Wis., West Allis—BOWLING ALLEYS—Rose Bowl Lane, 6101 N. Lake Dr., Milwaukee, Zone 17, plans by Fritz von Grossmann, 5456 W. Burleigh St., Milwaukee, bowling alleys, $2,000,000.

INDUSTRIAL BUILDINGS

▲ Ill., Franklin Park—RESEARCH ENGINEERING, Motorola, Inc., 4501 W. Augusta Blvd., Chicago, plans by Shaw Metz & Dolio, 208 S. LaSalle St., Chicago, 3 story, 74,000 sq. ft. research engineering and office bldg., Grand Ave. and Edginton, $1,100,000.

▲ Ill., Wood River—PLANT—Shell Oil Co., Wood River and 50 W. 59th St., New York, N. Y., fractionating unit and a phenol solvent extraction plant to replace existing units; expansion and improvement of facilities to separate wax and asphalt from petroleum; expansion of truck and barge shipping facilities, over $5,000,000. CD 11/14/51.

▲ O., Northampton—FACTORY—Alside, Inc., 1415 W. Waterloo St., Akron, factory to make aluminum siding for houses, on 82 acre site on Route 8, south of Steele's corners. $1,500,000.

▲ Pa., Exton—RESEARCH, ENGINEERING CENTER—Foote Chemical Co., 18 W. Chelton Ave. plans by Voorhees, Walker, Smith & Smith, 101 Park Ave., New York, N. Y., research and engineering center. $2,500,000. Bids about 1 year. CD 2/17.

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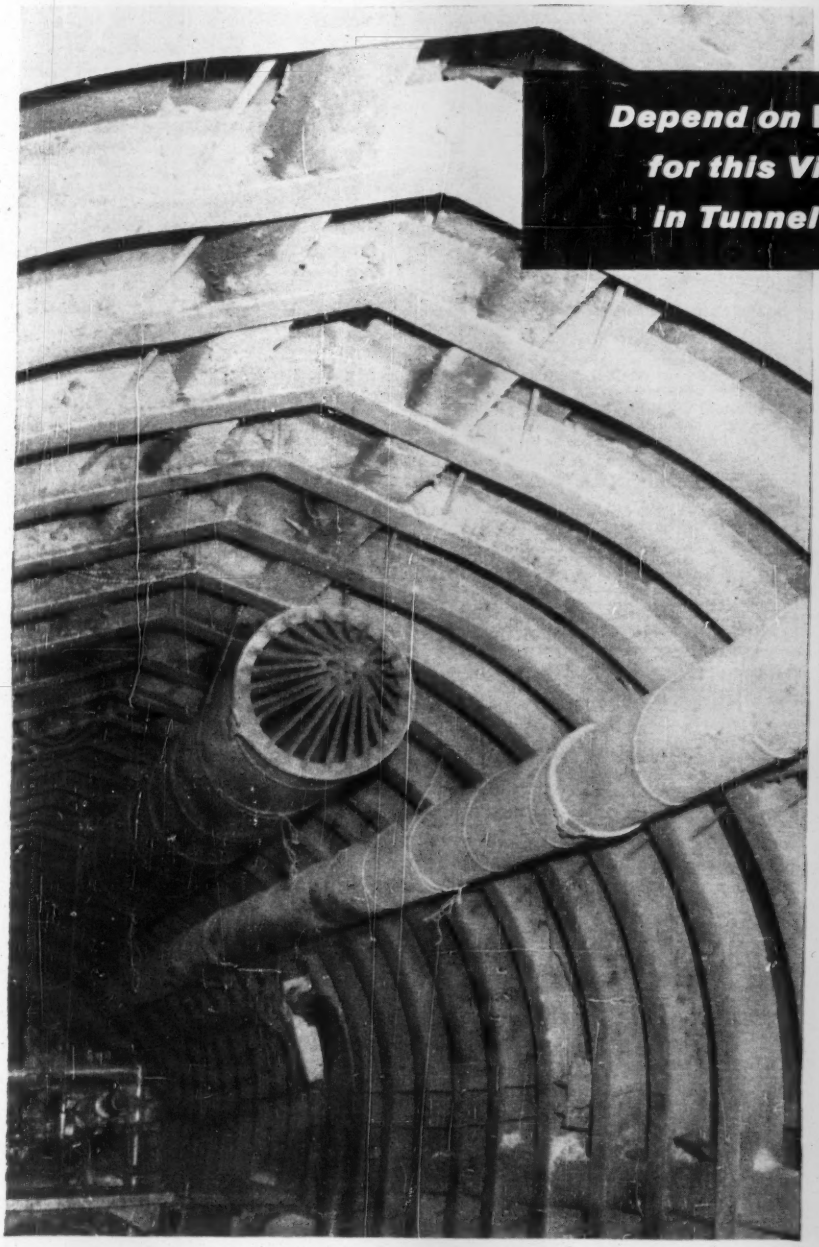

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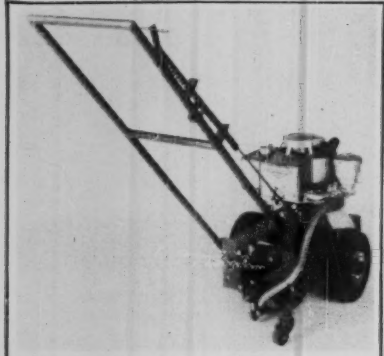

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BUILDINGS—LB & CA

▲ **Mark Realty, Inc.,** 18 Raymond Road, West Hartford, Conn. Owner Builds. **$4,000,000.** 240 HOUSES, Oak St., EAST HARTFORD, CONN.

▲ **Hayes Constr. Co.,** 1285 East St., New Britain, Conn., LB **$1,532,000.** est. $2,000,000 (9 bidders) Slade (North) JUNIOR HIGH SCHOOL, Steele Rd., NEW BRITAIN, CONN. School Bldg. Comn., High St., New Britain, Conn. Bids June 17. CD 5/26/58.

MIDDLE ATLANTIC

BUILDINGS—LB & CA

▲ **S. S. Silberblatt, Inc.,** 25 W. 45th St., New York 36, N. Y., LB **$14,094,000** (3 bidders) general contract (A) Rosedale Houses (Proj. No. NYC-311) located in area bounded by Rosedale Ave., Bruckner Blvd., Taylor Ave. and line parallel to Story Ave. separating City portion from Federal portion of project; (B) James Monroe Houses (Proj. No. NY-5-36) in area bounded by Taylor Ave., Lafayette Ave., Soundview Ave., Rosedale Ave. and Story Ave., Bronx Boro, NEW YORK, N. Y. New York City Housing Auth., 299 Broadway, New York, Zone 7, N. Y. Bids June 17. CD 6/11.

Heating Maintenance Corp. of New York, 220 E. 138th St., New York 51, N. Y., LB **$1,077,000** (5 bidders) heating and ventilating (New York, N. Y.).

Herman H. Schwartz, Inc., 179 So. Portland Ave., Brooklyn 17, N. Y., LB **$867,700** (10 bidders) electric work (New York, N. Y.).

C. K. Rehner, Inc., 76-01 Queens Blvd., Elmhurst, N. Y., LB **$366,000,** plumbing for Rosedale Houses (New York, N. Y.).

Fein-Schlosberg, Inc., 1770 Second Ave., New York 28, N. Y., LB **$996,000** (9 bidders) plumbing for Monroe Houses (New York, N. Y.).

Otis Elevator Co., 260 Eleventh Ave., New York 1, N. Y., LB **$576,000** (6 bidders) elevators (New York, N. Y.).

▲ **Psaty & Fuhrman, Inc.,** 369 Lexington Ave., New York 17, N. Y., CA **$2,959,000,** general contract MUSIC and ARTS BLDG. at Queens College, FLUSHING, N. Y. Bd. Higher Educ., Queens College, Bus. Office Bldg. H-65, 30 Kissena Blvd., New York, Zone 67, N. Y. Grand total $4,283,500. Bids May 1. CD 5/5, under LB;

Heating Maintenance Corp., 220 E. 138 St., New York 51, N. Y., CA **$597,000,** heating and ventilating for Music & Arts Bldg. (Flushing, N. Y.);

Teman Bros., 2 Chester St., Brooklyn 12, N. Y., CA **$727,500,** electrical work for Music & Arts Bldg. (Flushing, N. Y.).

▲ **Ragnar Benson Inc.,** No. 2 Gateway Center, Pittsburgh, Pa. CA **$2,500,000,** UNDERGROUND PARKING GARAGE and park, PITTSBURGH, PA. Equitable Life Assurance Society of U. S., 393 7th Ave., New York City, N. Y. and Bldg. No. 3, Gateway Center, Pittsburgh, Pa. Bids May 20. CD 5/20.

SOUTH

HEAVY CONSTRUCTION—LB & CA

▲† **Codell Co.,** P. O. Box 17, Winchester, Ky., LB **$3,444,609** Est. $3,854,436 (7 bidders), dam and spillway, Buckhorn Reservoir, Middle Fork, Kentucky River, Perry Co. ENG-15-029-58-56, KENTUCKY. U. S. Eng., P. O. Box 59, Louisville, Zone 1, Ky. Bids June 17. CD 6/9.

BUILDINGS—LB & CA

▲ **Pennington & MacKebee,** LaFollette, Tenn. LB **$1,764,000.** PATIENT TREATMENT BLDG. pool, lake and pavilion at Eeastern State Hospital for the Mentally Ill. KNOXVILLE, TENN. State Purch. Dpt., Nashville, Tenn.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲ **Ill., Rockford**—BA 7/10—Sanitary Dist. of Rockford, 3300 Kishwaukee St., secondary sewage treatment plant addn., piping, electric work, grading, **$1,500,000,** Greeley & Hansen, 220 S. State St., Chicago, engrs., CD 3/1/56.

HEAVY CONSTRUCTION—LB & CA

▲ **D. L. Amici,** 3717 Lake St., Melrose Park, Ill. CA **$1,393,133.** storm sewers and booster station, BELLWOOD, ILL. Village, 2726 St. Charles Rd., Bellwood, Ill. Bids May 28. CD 6/6, under LB.

▲ **Thomas H. Currie Co.,** 2531 Conner, Detroit, Mich., LB **$1,502,696,** CAA-9-20-032-57 19-FM 82-17-C32-WC 58-C6, TAXIWAYS and APRONS at Detroit-Wayne

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Airport, DETROIT, MICH. Wayne Co. Bd. Rd. Comrs., Rm. 726, City-County Bldg., Detroit, Mich. Joseph W. Gross, c/o owner, engr. Bids June 9. CD 10/17.

American Constr. Co., 4100 Brookpark Rd., Cleveland, 29, O., LB $325,583 (3 bidders) paving Dover Center Rd. from Center Ridge Rd. to Nickel Plate RR., Westlake, Cuyahoga Co., CLEVELAND, O. Cuyahoga County Comrs., Court House, Cleveland, 13, O. Albert S. Porter, City Engr., Standard Bldg., Cleveland, 13, O. engr. bids June 12, CD 6/6/58.

National Eng. & Contracting Co., 1968 W. 3rd St., Cleveland 13, O., CA $143,514, Constr. of BLEACHER, Clark Ave. and W 14 Playfield, CLEVELAND, O. Dpt. P. Properties, City Hall, Zone 14, Cleveland, bids May 22, CD 5/20/58.

Burk Development Co., 5859 E. 25 St., Indianapolis, Ind., LB $120,249, wid'n. Arlington Ave. from 2 to 4 lanes from University to Brookville Sts., INDIANAPOLIS, IND., Bd. P. Wks., City Hall, Indianapolis, Ind., Bids June 12, CD 12/9/53.

Michael Pontarelli Inc., 4248 N. Kilpatrick St. Chicago, Ill., CA $899,719. Contr. 4b-mft, Sec. 1012cs, Spec. 80.81-58-1, auxiliary outlet sewer 74 St. and 77 St., CHICAGO, ILL. City, City Hall, Chicago, Ill. Bids Apr. 2. CD 4/17, under LB.

▲ **Albin Carlson & Co.**, 5749 W. Augusta Blvd., Chicago, Ill., CA $486,932, curbs and gutters, Proj. 1958-1, CHICAGO, ILL., City, City Hall, Chicago, Ill., Bids June 11, CD 1/2/57.

Paolo Salce & Co., 7938 Grand Ave., Elmwood Park, Ill., CA $484,320, curbs and gutters, Proj. 1958-2, (Chicago, Ill.).

Union Contr. & Engr. Co., 2035 W. 43 St., Chicago, Ill., CA $144,661, bit. con. paving, N. Clark St. from N. Lincoln to W. Addison, (Chicago, Ill.).

Valley Builders, Inc., Spring Valley, Ill., CA $112,360, water filter plant addn., EUREKA, ILL., City, City Hall, Eureka, Ill., Warren & Van Praag, Inc., 253 S. Park St., Decatur, Ill., engrs.

Preston Woodall Co., Countryside Lane, Glenview, Ill., CA $326,448, sanitary sewer addn., Div. B, HIGHLAND PARK, ILL., City, City Hall, Highland Park, Ill., CD 4/30, under LB.

City, City Hall, Litchfield, Ill., cancelled bids to have been opened June 12, sewage disposal plant imprvs., LITCHFIELD, ILL. CD 5/20.

Thumim Constr. Co., 4435 N. Damen Ave., Chicago, 25, Ill. CA $345,732, sanitary sewers, watermains and sewage pumping station, MOUNT PULASKI, ILL. City, City Hall, Mount Pulaski, Ill. CD 4/9, under LB.

▲† **Bauer Bros. Constr. Co.**, 424 Lebanon Ave., Belleville, Ill., CA $1,780,536, AIRMEN'S DORMITORIES A, B and C, dining hall and related facilities, Eng-11-032-58-3, SCOTT AIR FORCE BASE, ILL., U. S. Eng., 475 Merchandise Mart, Chicago 54, Ill., Bids Apr. 17, CD 3/13.

BUILDINGS—LB & CA

Brose Constr. Co., 5431 Hetzell, Cincinnati, O., LB $705,865 (6 bidders) Second South Avondale SCHOOL, Carll St., CINCINNATI, O. Bd. Educ., 608 E. McMillan St., Cincinnati, O. bids June 17, CD 5/21/58.

▲ **G. W. Atkinson & Son**, 2505 N. Sixth St., Columbus, O., CA $4,533,960, general contract, White Cross HOSPITAL, Olentangy River Rd. and West North Broadway, COLUMBUS, O. White Cross Hospital, 700 N. Park St., Columbus, O. Inscho, Brand & Inscho, 60 E. Broad St., Columbus, O., archts. Bids June 3. CD 4/23/58, awarded June 11.

▲ **Victory Constr. Co.**, 5735 N. Dixie Dr., Dayton, O., CA $1,730,000, 150-unit low-rent HOUSING, Westview Terrace, LORAIN, O. Lorain Metropolitan Housing Auth., 2153 Lorain Dr., Lorain, O. Bids May 15. CD 5/28/58, under LB.

J. L. Simmons, 2100 N. Woodford St., Decatur, Ill., CA $755,400, (3 bidders), POST OFFICE AND COURT HOUSE, BENTON, ILL., General Services Admin., Wash., D. C., Bids May 8, Awarded June 11, lease-purchase, CD 5/14, under LB.

▲† **The Hoyle-Newberg and Gust K. Newberg Constr. Co.**, 2040 N. Ashland, Chicago, Ill. LB $10,127,000 Est. $10,937,111 235 units Capehart HOUSING (second increment) at K. I. Sawyer Air Force Base, MARQUETTE, MICH. Base Procurement Officer, K. I. Sawyer Air Force Base, Marquette, Mich. Bids June 18. CD 5/21.

▲ **Darin & Armstrong**, 2041 Fenkell, Detroit, Mich., LB $2,477,000, general contract JUVENILE DETENTION HOME, DETROIT, MICH. Wayne County Bd. Supervs., 7th Floor, City-County Bldg., Detroit, Mich. Bids May 27. CD 4/21.

John E. Green Plg. & Htg. Co., Inc., 220 Victor, Detroit, Mich., LB $738,830, mechanical work for Juvenile Detention Home (Detroit, Mich.).

Epstein Constr. Co., 4294 Mayfield Rd., Cleveland 21, O., LB $479,000 (base bid) (12 bidders) CITY HALL, GARFIELD HEIGHTS, O. City, 5551 Turney Rd., Garfield Heights, O. Geo. S. Voinovich, 1922 E. 107th St., Cleveland 6, O., archt. Bids June 12. CD 6/6/58.

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WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

▲ OKLAHOMA—BA 6/30—State Hy. Dpt., Capitol S, Oklahoma City, Oklahoma Co.—1.519 mi. of grading, drainage, stab aggreg. base and asph. conc. surface on 1-40 (four lane) near Tinker Field, $1,000,000; 3.095 mi. grading, drainage stab. aggreg. base and asph. conc. surface on 1-40 (4 lane roads near Tinker Field; est. $2,000,000 plus; clearing right of way for 1-40 (four lane road) Tinker Field, est. $750,000 plus. CD 6/17, under LB Bids June 3 rejected.

BUILDINGS—BA

▲ N. D., Fargo—CIVIC CENTER, etc.—BA 7/10—City, City Hall, Civic Center, comprising (1) auditorium, 150x175 ft., $1,200,000; (2) 2 story, 29,000 sq. ft. City Hall, $500,000. R. Rapson, 720 Washington Ave. S.E., Minneapolis, Minn. and Thorshov and Cerny, Inc., 400 Metropolitan Bldg., Minneapolis, Minn. and Seifert & Staszko Assocs., 325 Seventh St., Fargo, N. D., archts. CD 12/16/57.

▲† Colo., Colorado Springs—HOSPITAL—BA 8/18—Air Force Academy Constr. Agency, P.O. Box 1670, constr. of Academy Hospital, Air Force Academy site, IFB 05-613-58-49. Plans deposit $150.

▲ Tex., Houston—MOTOR HOTEL—Bids Asked—Flamingo Hotels Chain, 12501 Van Buren, Phoenix, Ariz., 200 unit motor hotel, 10000 Blk. Main St. $2,000,000. CD 5/5.

HEAVY CONSTRUCTION—LB & CA

▲† Atlantic, Gulf & Pacific Co., 15 Park Row, New York City, N. Y. CA $2,560,277, dredging Sabine Neches Waterway at mouth Neches River, Orange, Jefferson Counties, TEXAS. U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex. Bids June 10. CD 6/2.

▲ Acme Constr. Co., 6000 NW 39th St., Oklahoma City, Okla., LB $1,281,489, Runway barrier and overrun, Tinker Field (Will Rogers Field), ENG. 34-066-58-66, OKLAHOMA CITY, OKLA. U. S. Eng., Box 61, Tulsa, Zone 2, Okla. Bids June 11. CD 5/29/58.

▲† H. B. Zachery, P.O. Box 10188, San Antonio, Tex., LB $6,822,104, est. $7,578,595. Base Bid. 500 units Capehart HOUSING, Sheppard Air Force Base, ENG-41-612-58-72, WICHITA FALLS, TEX. Procurement Officer, Sheppard Air Force Base, Wichita Falls, Tex. Bids June 17. CD 5/21.

▲† Heers Assocs., 5917 Jurupa, Riverside, Calif., LB $2,300,000, 150 units Capehart HOUSING, Malmstrom Air Force Base, GREAT FALLS, MONT. Procurement Officer, Malmstrom Air Force Base, Great Falls, Mont. Bids June 10. CD 5/21.

† George E. Mefford, Nacogdoches, Tex. LB $60,632 est. $74,452 flood water retard. structures with earthfill embankments, sites 11-B and 12, Elm Fork of Trinity River, Gainesville, in Cooke Co. SCS 98-TX58 TEXAS. Soil Conservation Service, 1st National Bank Bldg., Temple, Tex. Bids Apr. 29. CD 4/10.

† Johnson & York, Medina, Tex., LB $142,247 est. $137,798 flood water retard. structures with earthfill embankments, sites 12, 15 and 16 Brady Creek, in McCullough Co. SCS 118-TX-58 TEXAS. Soil Conservation Service, 1st National Bank Bldg., Temple, Tex. Harold R. Baker, P.O. Box 417, Temple, Tex., engr. Bids June 5. CD 5/22.

† Vilbig Constr. Co., 2026 Singleton Blvd., Dallas, Tex. LB $54,279 est. $63,506 flood water retard structures with earthfill embankments, sites 4 and 5, Chambers Creek, Midlothian, in Ellis Co. SCS 108 TX 58 TEXAS. Soil Conservation Service, 1st National Bank Bldg., Temple, Tex. Bids May 28. CD 5/7.

BUILDINGS—LB & CA

▲ Denehey Constr. Co., Braniff Bldg., Oklahoma City, Okla., CA $2,091,703, 7 story hospital ADDN., OKLAHOMA CITY, OKLA. St. Anthony's Hospital, 601 NW 9th St., Oklahoma City, Okla., C. L. Monnott, 3031½ Classen Oklahoma City, 6, Okla. archt. Awarded June 14.

▲† Robertson Constr. Co., Inc., 4015 W. Jefferson Blvd., Los Angeles, Calif. LB $7,253,000. est. $8,000,000. 500 Capehart FAMILY HOUSING units ENG 41-443-58-65, FORT HOOD, TEX. U. S. Eng., Box 1600, Fort Worth, Tex. Alexander, 2712 Danfield Ave., Dunaway & Jones, 2706 Richmond, and B. Johnson, 4926 Travis St., all Houston, Tex. archts.-engrs. Bids June 17. CD 5/14.

▲ Dickmann-Pickens-Bond Constr. Co., Gazette Bldg., Little Rock, Ark., LB $3,766,397. Jefferson HOSPITAL 40 and Mulberry Sts., PINE BLUFF, ARK. Jefferson Co., Court House, Pine Bluff, Ark. Bids June 5. CD 5/20.

Cain, Brogdon & Cain, 2333 Grafton, Fort Worth, Tex. CA est. $600,000. 1 story 800x140 ft. 120,000 sq. ft. SHOPPING CENTER, Evans Ave. and E. Berry Sts., FORT WORTH, TEX. Ward Associates Inc., 304 N. Walton, Dallas, Tex. Chas. E. Armstron, 1013½ University Dr., Fort Worth, Tex. archt. Awarded June 12.

▲ Centex Constr. Co., 4606 Greenville, Dallas, Tex. Owner builds. $377,100. 35 DWELLINGS $363,000. 29 dwellings FARMERS BRANCH, TEX. CD 5/5.

FAR WEST

HEAVY CONSTRUCTION—BA

▲† Calif., Lompoc—LAUNCH COMPLEX—BA 7/16—U. S. Eng., 751 S. Figueroa St., Los Angeles, constr. launch complex 65-2 consisting of launch operations bldg. and 3 launch and service bldgs. and utilities at Cooke Air Force Base, ENG-04-353-5819. $5,000,000-$10,000,000.

HEAVY CONSTRUCTION—LB & CA

▲ General Electric Co., 235 Montgomery St., San Francisco, Calif. LB $2,442,482 (4 bidders) furnishing, delivering 68,000 kva vertical 1 shaft, water wheel driven, alternating current, synchronous type generators and excitation switch with appurtenant equipment and controls for Jaybird Power House, Upper American River Proj. El Dorado Co. SACRAMENTO, CALIF. Sacramento Municipal Utility Dist., 2101 K St., Sacramento, Calif. Bids June 18. CD 6/5.

BUILDINGS—BA

▲ Wash., Bellevue—SCHOOL—BA 7/15—School Dist. 405, five 116,000 sq. ft., masonry bldgs. for high school, $1,500,000. Plans deposit $50. Naramore, Bain, Brady & Johanson, 904 7 Ave., Seattle 1, Wash., archts., CD 3/21.

▲ Wash., Seattle—SCHOOL—BA 7/22—School Dist. No. 1, 815 4 Ave. N., North Seattle High School, N. 135 St. and Ashworth Ave., $3,000,000. Plans deposit $50. Naramore, Bain, Brady & Johanson, 904 7 Ave., Seattle, Zone 1, archts., CD 12/4/56.

HEAVY CONSTRUCTION—LB & CA

▲† M. H. Hasler Constr. Co. 458 S. Spring St., Los Angeles, Calif. and H. C. Smith Constr. Co., 2400 Rowena Ave., Los Angeles, Calif. CA $2,101,140. 1st stage earthwork and exten. drainage in borrow area A and placing excavated material in dam embankment, Willard Dam, Weber Basin Proj. Spec. DC 5032 UTAH. Bureau Reclamation Dpt. Interior, Ogden, Utah. Bids May 21, Awarded June 12 CD 5/26 under LB.

BUILDINGS—LB & CA

▲ M&K Corp., 519 California St., San Francisco Calif. LB $4,664,000. (6 bidders) 2 story, bsmnt., rein-con., 7 stories, steel frame STUDENT UNION, BERKELEY, CALIF. University of California, Bd. Regents, Admin. Bldg., Berkeley, Calif. CD 6/28/57.

Singleton Constr. Co., P. O. Box 271, Eureka, Calif. CA $694,000. 3 story 30,000 sq. ft. and bsmnt., CITY HALL on 6th and K Sts., EUREKA, CALIF. City, City Hall, Eureka, Calif. Awarded June 11. CD 5/22, under LB.

▲ Harris Constr. Co., P. O. Box 109, Fresno, Calif. CA $1,148,000. Kings Canyon Junior HIGH SCHOOL, Tulare and Helm Ave. (11 separate bldgs.) FRESNO, CALIF. Fresno City Unif. School Dist., c/o Supt., 2348 Mariposa, Fresno, Calif. Bids May 29, Awarded June 12 CD 6/10, under LB.

Paul Wright & Ben Oretsky, 1290 Parsons Dr., Santa Rosa, Calif. LB $431,500. Novato High SCHOOL ADDNS., NOVATO, CALIF. Novato Unif. School Dist., 625 Arthur St., Novato, Calif. CD 11/6.

C. R. Lund, 447 Glencoe, Fremont, Calif. LB $363,250. (7 bidders). Allendale ELEMENTARY SCHOOL OAKLAND, CALIF. Oakland City Unif. School Dist., c/o Supt., 1025-2nd Ave., Oakland, Calif. Bids June 10. CD 5/14.

▲ F. P. Lathrop Constr. Co., 800 University Ave., Berkeley, Calif. CA $1,404,525 reconstr. 73,500 sq. ft. Petaluma HIGH SCHOOL (4 new bldgs.) PETALUMA, CALIF. Petaluma City School Dist., c/o Supt., 5th and B Sts., Petaluma, Calif. Bids June 4, Awarded June 11, CD 6/12 under LB.

Howard F. Layne, 747 N. Huntington St., San Fernando, Calif. Owner builds. $95,000. INDUSTRIAL bldg. at 2021 1st St. SAN FERNANDO, CALIF. Edmond C. Foerstel, 317 Bandy Ave., West Covina, Calif., engr.

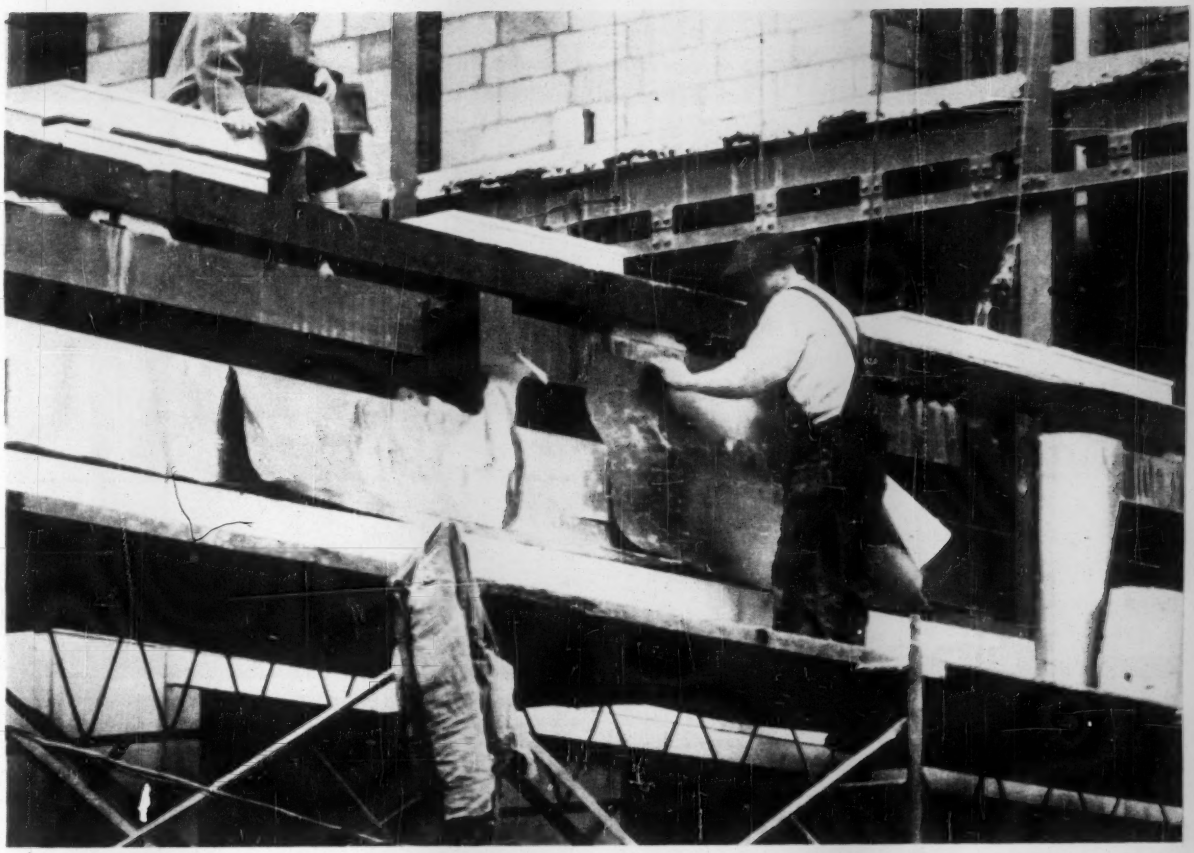
▲† Oscar E. Anderson, P. O. Box 251, San Jose, Calif. CA $1,107,633 2 story 109,000 sq. ft. INDUSTRIAL ARTS BLDG. about 800 sq. ft. steel frame penthouse 800 sq. ft. covered vehiculed shelter at San Jose State College W. O. 4005GC-44 SAN JOSE, CALIF. State Div. Architecture, 1120 N. St., Sacramento, Calif. Bids June 10. Awarded June 12. CD 6/12, under LB.

▲ Ross B. Hammond Co., 1241 North Williams Ave., Portland, Ore., LB $6,043,142, est. $6,330,000 (5 bidders) first phase of Dammasch General Mental HOSPITAL, near Wilsonville, Clackamas Co., PORTLAND, ORE. State Bd. of Control, Salem. Stanton, Boles, Maguire & Church, Concord Bldg., Portland, Ore., archts. Bids June 17. CD 5/15/58.

CANADA

HEAVY CONSTRUCTION—LB & CA

▲ J. A. Jones Constr. Co., 801 Second Ave., New York, N.Y., CA $5,636,870. 200 family HOUSING Units and services at Harmon Air Force Base. STEPHENSVILLE, NEWFOUNDLAND. U.S. Eng., Eastern Ocean Dist., c/o Defence Constr. Ltd., 56 Lyon St., Ottawa, Ont. Bids Apr. 30. CD 5/13, under LB.



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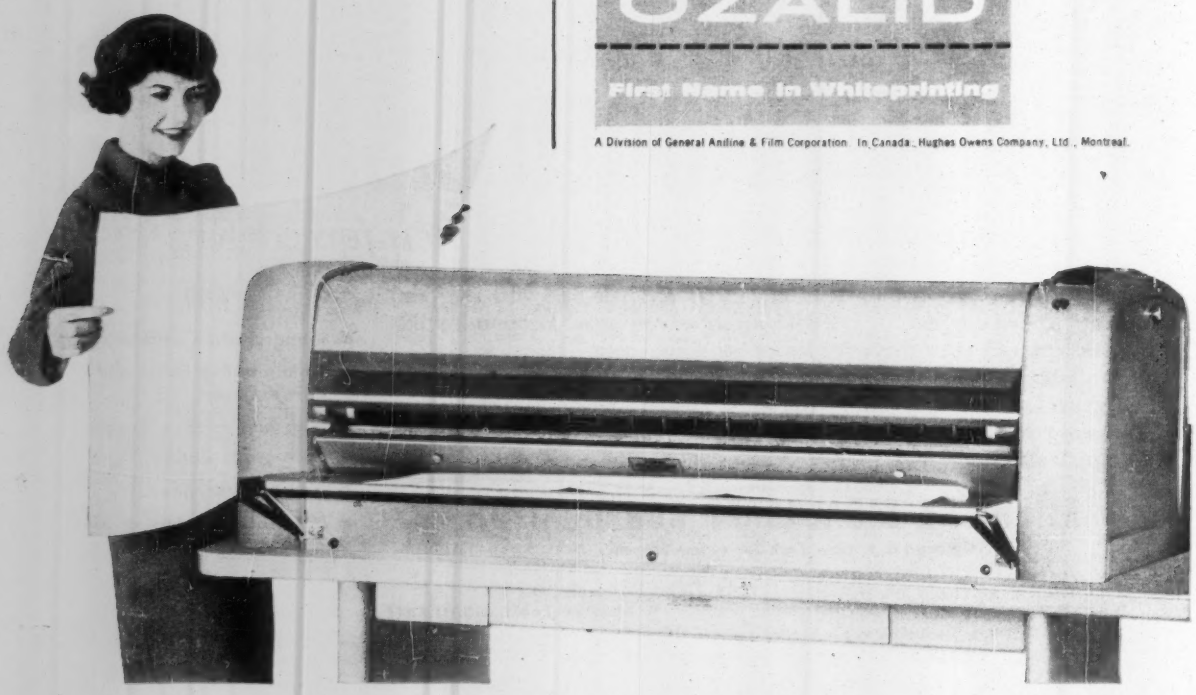
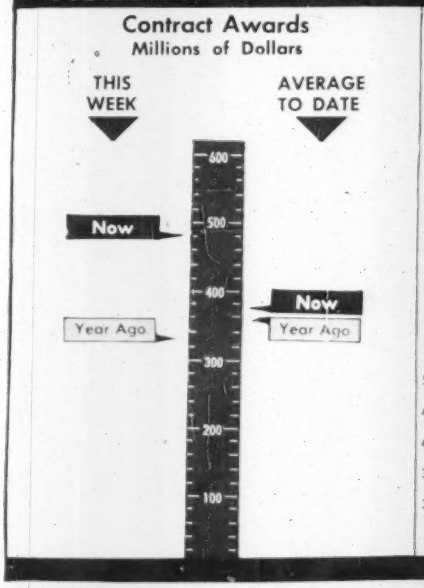


Construction Scoreboard

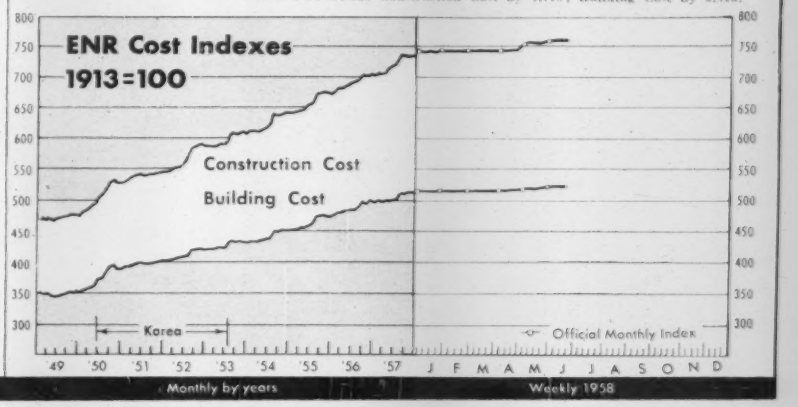
ACTIVITY THIS WEEK



COST INDEXES AS OF NOW

ENR INDEXES (1913=100), 20-cities' average	Week of June 19 1958	% Change from May 22 1958	% Change from June 20 1957
Construction Cost	758.15	+0.4	+4.7
Building Cost	522.21	+0.5	+3.2

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850. 1949 = 100: Divide Construction Cost by 4.779; Building Cost by 3.518.



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 26 wks 1958 millions	Chge '57-'58 %
All Heavy Constr.	$483.1	$9,628.1	+2
Private	126.3	4,172.3	−5
Public	356.8	5,455.8	+8
State & Municipal	233.9	3,998.5	+10
Federal	122.9	1,457.3	+5
By Type of Work			
Public			
Waterworks	4.6	157.4	−22
Sewerage	11.5	304.7	+18
Bridges*	33.9	304.4	−17
Highways	104.2	1,541.3	+1
Earthwork, Waterways	47.2	604.5	+3
Buildings, Excl. Housing	54.1	1,302.4	+13
Housing	47.4	585.4	+65
Unclassified	53.9	664.2	+4
Private			
Mass Housing	72.4	1,921.5	+23
Commercial	30.6	1,010.8	+15
Industrial	18.6	987.3	−43
Unclassified	4.7	244.2	+5

* Includes private bridges.

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

NEW CAPITAL FOR CONSTRUCTION

	Week of June 19	Cum. 25 wks 1958 millions	Chge '57-'58 %
Corporate Securities	$117.1	$2,754.4	−9
State and Municipal:			
All Except Housing	65.0	3,521.4	+28
Housing	...	33.8	−63
Federal Loans	3.7	91.0	−20
Federal Aid	...	0	−100
Total Nonfederal	$185.8	$6,400.7	−20
Federal Appropriations:			
Projects in U. S.	...	$606.7	+209
Outside U. S.	...	....	−100
Total New Capital	$185.8	$7,007.4	−12

BACKLOG OF PROPOSED HEAVY CONSTRUCTION

	May 1958 (millions)	Percent Change from last Month	Year
Total U. S. (ENR reported)	$112,120	−0.5	+5.4
By Ownership—			
Private	47,554	−0.04	+5.3
State & Municipal	50,933	−0.06	+6.3
Federal	13,633	−1.7	+2.0
By Type of Work—			
Waterworks	2,666	+10.4	+17.1
Sewerage	3,446	+1.0	+4.1
Bridges	3,437	−0.3	+12.1
Highways	13,326	−1.2	+3.7
Earthwork, Waterways	11,852	−3.4	+6.1
Public Buildings	19,975	−0.3	+2.4
Industrial Buildings	16,606	−0.4	+1.1
Commercial Buildings	21,097	+0.4	+9.4
Unclassified, Private	9,851	−0.2	+4.2
Unclassified, Public	9,864	−0.8	+8.6

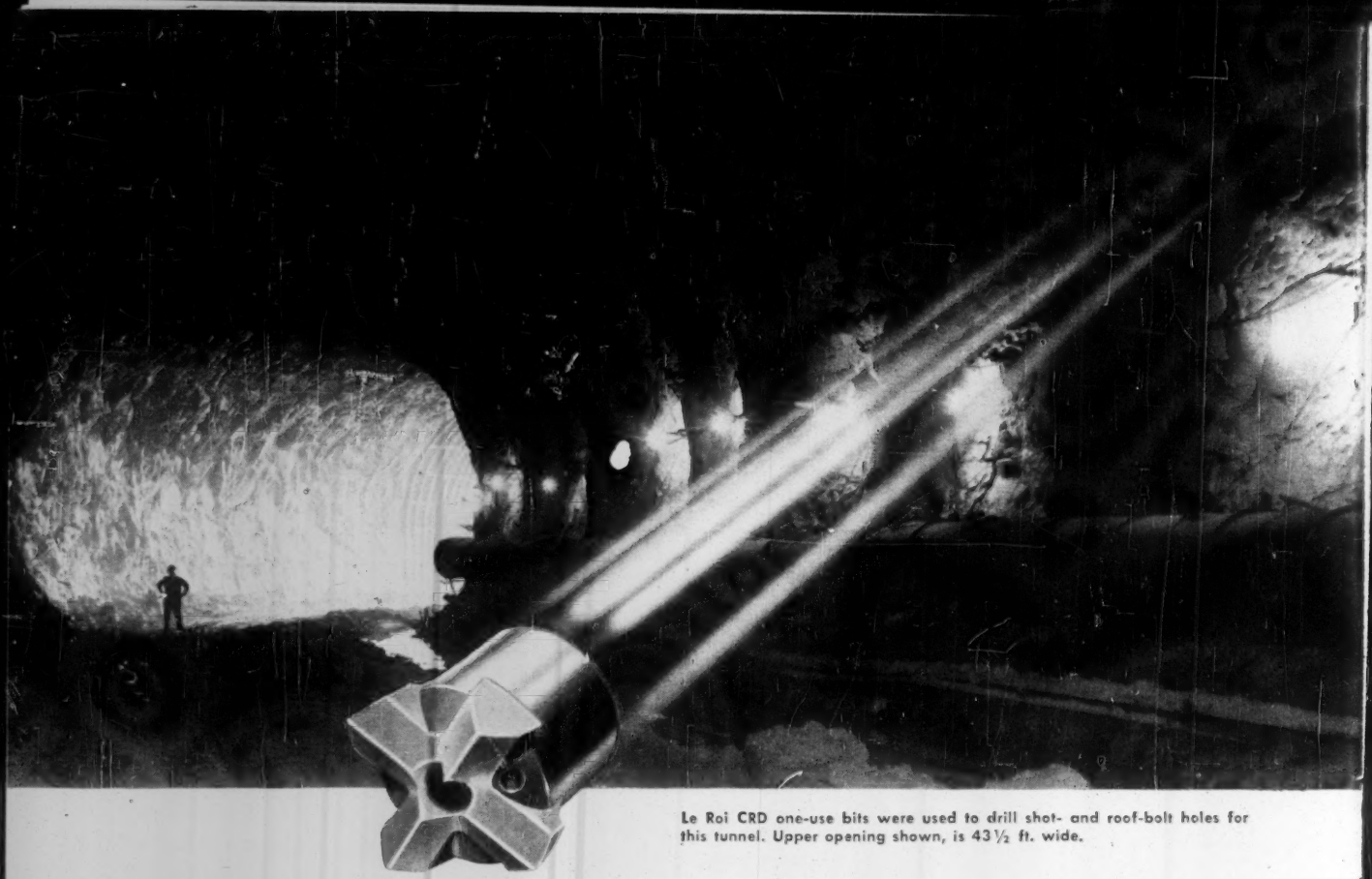
FLOW OF NEW PROJECTS INTO THE BACKLOG

	1958 May (millions)	1958 5-months (millions)	Percent Change from '57 May	Year Cum.
Total U. S. (ENR reported)	$1,298	$7,053	−10.0	−18.3
By Ownership—				
Private	513	3,025	−25.7	−32.4
State & Municipal	709	3,465	+6.6	−5.7
Federal	76	563	−11.4	+16.3
By Type of Work—				
Waterworks	286	344	+252.9	+65.3
Sewerage	84	311	+31.1	+11.8
Bridges	22	240	+10.0	+18.2
Highways	44	916	−68.0	−24.3
Earthwork, Waterways	10	128	+337.8	+87.3
Public Buildings	271	1,487	−28.0	−20.2
Industrial Buildings	74	589	−61.3	−64.2
Commercial: Mass Housing	192	919	−29.2	−18.6
Other Building	222	1,370	−10.2	+5.4
Unclassified, Private	26	146*	−75.7	−63.6
Unclassified, Public	68	602	+3.2	+82.8

*Includes private bridges, $500,000.

FLOW OF PROJECTS OUT OF BACKLOG INTO CONTRACTS

Total U. S. (ENR reported)	1,285	4,131	+36.9	+1.8
By Ownership—				
Private	355	1,315	+1.0	−15.6
State and Municipal	665	2,159	+48.1	+17.0
Federal	265	657	+92.2	+0.2



Le Roi CRD one-use bits were used to drill shot- and roof-bolt holes for this tunnel. Upper opening shown, is 43½ ft. wide.

Only CRD Bits Meet Glen Canyon Test

"The CRD one-use bit was superior to any of the ten brands we tested," reports superintendent.

Maintain 15 ft. daily pace through solid sandstone.

Pre-job tests revealed that the Le Roi CRD one-use bits offered the best cost-output advantages for the grueling job ahead. That's why they were chosen to drill two spillway tunnels through solid sandstone for the Glen Canyon Dam in Utah.

Here's how they scored. "Drilling in this sandstone," the tunnel superintendent reports, "the CRD bits averaged 48 ft., compared to an average of only 32 ft. for the other nine competing brands."

"Some bits were a little more durable," he adds. "But they cost up to $12 each, compared to the 24 cents we pay for each CRD bit."

Carbide bits were also tried, but proved impractical. The sand encountered on the job was as abrasive as the grinders used to sharpen the bits, causing them to lose their gauge too quickly.

Help Keep Schedule

On the job, the Le Roi bits are living up to expectations. "We use them to drill shot holes under the roughest conditions I've ever seen," the superintendent states.

In addition to the highly abrasive stone, the bits have to cope with mud and bad water seepage. Yet the bits average 4 to 4½ minutes per 18 ft. hole. As a result, "the first of the two long tunnels is being dug at an average rate of 15 ft. per day."

Le Roi H10AL air legs are used with the CRD one-use bits and comprise 95% of the drilling equipment used on the job. "The Le Roi units are doing a good job for us in the tunnel, helping us to keep the project on schedule," the superintendent concludes.

Investigate the advantages of low-cost Le Roi one-use bits for your next drilling job. Ask your Le Roi distributor about them, or write direct to Le Roi Division, Westinghouse Air Brake Co., Milwaukee 1, Wisconsin. AT-723

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Construction Leads Business Rebound

The recession appears to have hit bottom, or close to it. An increasing number of economic indicators point to some recovery during the rest of this year.

You can see it best in terms of gross national product, the total value of goods and services produced. GNP has dropped about $20 billion (annual rate), from a peak of $440 billion in the third quarter of last year.

By the end of this year, the economy should regain about $10 billion to $15 billion of that $20 billion drop (see chart). That won't mean a return to boom conditions. But it will demonstrate that the economy is on the way up again.

Increased construction activity is shaping up as one of the strong factors. Heavy construction contract awards, as reported by ENR, are now ahead of 1957 for the first time. As of last week total awards were 0.3% above 1957's same period. Most of the gain is in state and municipal work, but as claimed earlier (ENR June 12, p. 152), the "rest-stop" is over for construction in general.

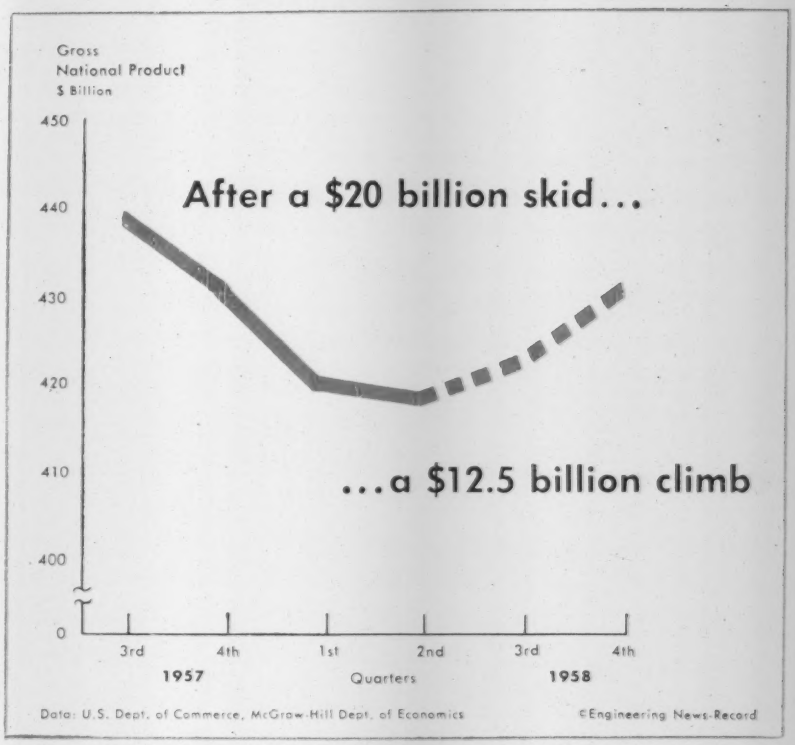
In homebuilding, ENR's private mass housing awards are running over 22% ahead of the 1957 pace, and 56% ahead in public housing. FHA and VA applications also have picked up sharply since federal mortgage regulations were relaxed and the money market eased earlier this year.

These advance indicators point to several strong months ahead for the construction industry. This strength will supply a boost for business in general. Already, rising construction payrolls are being given much of the credit for the April-May rise in wage and salary income, the first month-to-month increase since last August.

There are other promising signs in the business outlook:

Consumer expenditures, generally, have been holding up fairly well. They can be expected to follow a rising trend through the rest of this year. Spending on services has kept moving up steadily. Spending on non-durables slipped only a little during the winter, and consumers are spending more on food than ever before.

Only in durable goods purchases—notably cars—has consumer spending dipped appreciably. And a dragged-out model changeover period, with the prospect of very few basic style changes in '59 models, makes most economists dubious about expecting much lift from auto sales this fall. Appliance sales, however, are showing improvement, because of the rise in homebuilding.



Government spending for goods and services on federal, state and local levels will be moving up. Federal spending is only now getting back to where it was in the spring of 1957, before the cutbacks in defense orders. By the final quarter of this year total government outlays for goods and services will be some $5 billion higher than they were in the first three months.

Increases of around 10% in most postal and civil service salaries will put part of this increase into the spending stream. The rest will come mostly through stepped-up defense buying and the rise in public construction.

Inventory reduction, one of the chief downward pressures on business, can't continue much longer at its current rate. In recent months, business has been living off inventories to the extent of nearly $10 billion (computed at an annual rate). Even at reduced sales levels, it cannot continue this indefinitely without ordering many items that have been coming out of stock.

The inventory reduction has been especially heavy among durable goods manufacturers, particularly in raw materials on hand and goods in process. A pickup in sales would catch many of these manufacturers short of materials and would require a quick speed-up of orders and production schedules.

The gloomy exception to the improving business picture for the rest of 1958 is business investment in new plant and equipment. The latest survey of the U. S. Commerce Department and Securities and Exchange Commission reports that business plans to spend 17% less this year than in 1957 (ENR June 12, p. 134). The rate of spending, furthermore, will be dropping quarter by quarter.

The expected improvement in business sales probably will serve only to forestall additional slashing of capital budgets. It would take a much sharper advance than now seems likely to put any pressure on productive capacity and spur construction of new facilities. This is something to look for in 1959 or 1960—not in 1958.

(B&F continued on page 80)

Public Works Downed in Omaha

A so-called "taxpayers' revolt" in Omaha last week resulted in the resounding defeat of 13 bond issue proposals totaling $53.7 million. The proposals each were rejected by margins ranging from 2½ to 1 to 5 to 1.

Funds from the bonds would have paid for sewers, sewage treatment plant, roads, urban redevelopment, fire and police facilities, and airport improvements.

Three of the 13 issues were considered by city officials as "critically needed." These were sanitary and storm sewer bonds, both totaling $17.8 million, and street improvement bonds amounting to $15.4 million.

Other proposals were: $6 million—parks and recreation facilities; $4.5 million—new central library building and new branch library building; $2.7 million—redevelopment of a 43 block area adjacent to the downtown business district.

Also, $2.5 million—new police station; $2 million—airport improvements; $1.3 million—six new firehouses and modernization of five existing units; $1 million—land acquisition for a civic cultural center; $350,000—municipal garage; $200,000—improvement of city auditorium.

• **Omaha plan dumped**—Defeat meant rejection of a well-publicized "Omaha plan," developed over a three year period by a blue ribbon committee of 300 top businessmen, professional men and labor leaders. The bond issues would have provided for completion of most of the city's basic needs.

Passage of the bond issues would have meant a boost in real estate taxes and sewer-use fees. There was outspoken resentment against the higher taxes and fees. This in turn was coupled to remarks that "the cost of living is too high now." But, ironically, few of the city's residents denied the need of the facilities that would have been provided. "We need them—but not now," was a frequently expressed comment.

• **Tactical error**—City officials and other backers of the improvement program now think it was a mistake to present the entire package at one special election, instead of a series. The sewer and street bond proposals, however, are expected to be placed on the ballot again, possibly in November.

The street bonds would have financed a system of expressways, connecting streets and approaches to an interstate highway that will pass near the Omaha area.

The sewer bonds would have brought the city into compliance with federal government interest in halting sewage disposal into the Missouri. The funds were to provide a treatment plant and several interceptors. Omaha has until the end of 1959 to place the treatment plant under construction contract.

The defeat of the urban redevelopment and airport issues also lost the city $7.4 million in federal matching funds. The airport terminal facility was vigorously opposed by seven of the nine railroads operating in the area.

Cost Cutting

Experts seek ways to cut the cost of estimating

The American Association of Cost Engineers last week turned some attention to cutting the cost of estimating. The 217 attending the annual meeting at Cleveland's Case Institute of Technology also discussed computer use.

Cost of estimating was discussed by Kenneth G. Wolfe, assistant chief estimator for Bechtel Corp., San Francisco. He broke down the number of man-hours required to prepare a firm cost estimate for bidding, using a $2 million to $5 million refinery as an example.

The estimating job was divided into four parts: Scope, which includes plans and specifications analysis, 900 man-hours; quantity takeoff, 200 man-hours; pricing, 210 man-hours, plus an additional 150 man-hours for overhead evaluation; and review, 120 man-hours. Total man-hours—1,580. Pricing time also included purchasing department man-hours.

Mr. Wolfe said the cost of work varies with the class of work. Refineries range from 400 to 750 man-hours per $1 million of cost; power plants take 150 man-hours per $1 million; industrial 125 to 175 man-hours per $1 million. Experience with each type of construction over a period of time, however, will reduce estimating costs, according to Mr. Wolfe.

Sessions on the use of electronic computers dealt largely with analysis of profitability in economic terms and the refinement of end-product design to achieve less expensive production.

Charles J. Bauman of John F. Meissner Engineers, Inc., Chicago, emphasized that engineers must understand computer techniques thoroughly enough to state problems clearly and accurately and to define them mathematically.

Technical committees of the association presented preliminary reports suggesting four classes of cost estimates and defined their recommended accuracy range and purposes.

They ranged from the order of magnitude estimate to the detailed estimate. The first can help management decide whether a project is worth further study. The detailed estimate is undertaken to establish a contract price so a firm bid can be entered. Accuracy of this estimate should be held to plus or minus 5%.

A preliminary version of a proposed cost-estimating code will receive more study along with data sheets on heat exchanger costs. The sheets will be the prototype of future data for an AACE manual.

The association's 1958 Award of Merit to the outstanding cost engineer went to Cecil H. Chilton, an editor of CHEMICAL ENGINEERING, a McGraw-Hill publication. The group's 1959 meeting will be in Pittsburgh.

Wisconsin Legislature Plans Aid for Redevelopment

A special session of the Wisconsin legislature has passed legislation aimed at speeding urban renewal. It also approved a boost in unemployment compensation and extended the period of payments from 26½ weeks to 39 weeks.

The urban renewal legislation allows cities to establish urban renewal authorities having the power to condemn land. Formerly, a jury verdict of necessity was required to obtain land within areas to be redeveloped if negotiations failed.

Milwaukee is expected to be helped quickly by the enactment. A blighted area of 32 acres in that city was to be converted for light industry. However, a jury verdict withdrew 20 land parcels from the program.

Federal money, therefore, was ordered withheld from other projects until suitable legislation was provided. Now, federal assistance totaling $73.7 million will become available for five projects. The city will add another $32.8 million for streets, sewers and other construction. Private developments will invest approximately $376 million.

Unemployment benefits will rise from a maximum of $38 weekly to $42.

August Start for Port Job

The Port of New York Authority is losing no time in implementing its plans for $232 million in new construction in the Newark-Elizabeth, N. J., port area (ENR April 24, p. 114). Construction of a $6.1 million terminal at Port Newark will start in August.

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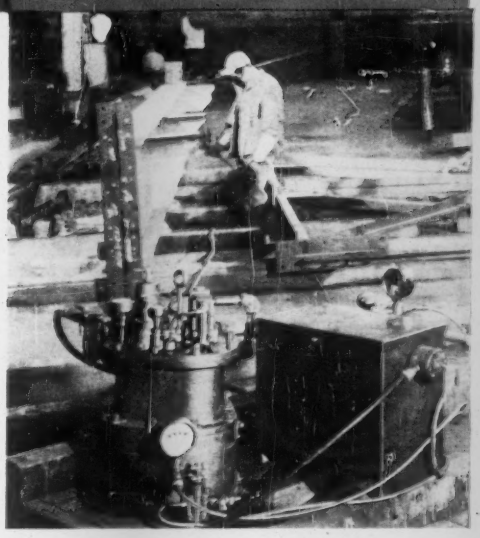

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Boycotts: Confusion Confounded

Supreme Court rules hot-cargo clause is no defense to secondary boycott, many questions unanswered

The Supreme Court last week ruled on one of the construction industry's most troublesome problems. But in the wake of the decision there's as much confusion as ever.

In a split decision, the court ruled that existence of a hot-cargo clause in a labor contract does not legally justify a union strike to enforce the clause. That's the sum of an 18 page opinion written by Justice Felix Frankfurter on a question that's been before the National Labor Relations Board and the courts for nine years.

Left unanswered are these questions:

- Is a hot-cargo clause valid or invalid?
- Is union pressure on employers to sign or live up to a hot-cargo clause—as opposed to pressure on employees—valid or invalid? (The labor law recommendations of the Administration now before Congress call for a clear ban on such union activity.)
- If an employer reneges on a hot-cargo clause in his labor contract, does this constitute a breach of contract for which the union can sue for damages? (A lower federal court, for example, has just held that a contractor can sue a union for damages for its failure to live up to an invalid contract clause.)

Reaction of the dissenters (Chief Justice Earl Warren and Justices William Douglas and Hugo Black) to the majority opinion is short and concise: It's "capricious" and is what you might expect from a "committee of Congress" but not from a court.

• The background—Three cases were before the court. One involved union refusal to handle nonunion goods. The other two involved refusal of teamsters working for common carriers to handle products manufactured by a struck employer. The cases were consolidated.

The construction case arose with the carpenters union on a Los Angeles hospital project for which Haystad & Jensen were general contractors. It's known as the Sand Door case.

The millwork contractor purchased doors from Sand Door and Plywood Co., a distributor. The doors were made by a nonunion firm. The carpenters refused to hang the doors, relying on a clause in their labor contract with Haystad & Jensen that read: "Workmen shall not be required to handle nonunion material."

The NLRB, the Ninth Circuit Court of Appeals and now the Supreme Court say the carpenters refusal was inspired by the union and violated the law, even though their contract gave them the right to refuse to handle the doors.

• The law—The law mentions neither secondary boycotts nor hot-cargo clauses. Both, however, are within the scope of the unfair labor practice section of the Taft-Hartley Act.

That section forbids a union to induce employees to strike or to refuse to handle materials if the object is to force any employer (such as the contractors in the Sand Door case) to quit doing business with someone else (Sand Door or the door manufacturer). A hot-cargo clause is essentially a union reservation of the right to refuse to handle goods that accomplishes the same purpose. In either case, it's the secondary employer who gets the headaches. He's the immediate employer who isn't involved in the basic labor dispute at all and is considered neutral. The basic dispute is with the primary employer and he is usually removed and remote from the secondary boycott activity.

According to Justice Frankfurter, congress has not engaged in the "wholesale condemnation of secondary boycotts." It has not given primary employers or secondary employers or the public any "absolute assurance" against boycotts. It has protected them only against boycotts that stem from a union's effort to induce employees to engage in them.

The result, says the court, is that a voluntary boycott is permitted by law. If there is a hot-cargo clause and if the employer agrees to honor it, the resulting boycott is legal.

• The decision—How, then, does the court reach the conclusion that a strike or concerted refusal to handle goods in reliance on a hot-cargo clause is illegal?

The court's answer is this: We reject the argument that the clause is a defense "as not comporting with the legislative purpose to be drawn from the statute, projected onto the practical realities of labor relations."

By this, the court explains, it means that Congress intended to give an employer a free choice—one not dictated by union pressure—in deciding who he will deal with. In order to be meaningful, that freedom of choice must be exercisable at the crucial moment—instead of during the heady times of collective bargaining. It's only when faced with a concrete situation that an employer can weigh "labor and business policy" and exercise "responsible" judgment. That freedom cannot be abridged by a union attempt to enforce a hot-cargo clause in the manner prohibited by Congress—a union appeal to employees to refuse to work or to handle certain goods.

• The result—The dissenting justices made some candid observations that may plague Capitol Hill for some time:

- In each of the three cases, said Justice Douglas, the hot-cargo clauses were obtained in the union contracts by legitimate means. All are aimed at a legitimate labor objective—elimination of competition from nonunion goods.
- Congress has nowhere indicated that such clauses in collective bargaining contracts are unlawful.
- On the the contrary, the Taft-Hartley Act gives employees "the right . . . to engage in . . . concerted activities for the purpose of . . . mutual aid or protection."
- The employers agreed to the clauses voluntarily and this now defeats any claim of coercion—and that's all Congress outlawed.
- If the tables are to be turned, it's up to Congress, not courts, to do it.

Net result is that the boycott confusion has been increased rather than diminished. And Congress, already up to its neck in labor legislation (see p. 24), has a greater challenge than ever before on a significant labor problem.

Contractors and other employers in the meantime, are left in a difficult and potentially costly situation. They'll doubtless become more wary of buying a pig-in-a-poke by consenting to hot-cargo clauses in collective bargaining agreements and will become increasingly sensitive to unlawful union attempts to obtain that consent. And unless Congress rewrites the law, they'll have to engage in protracted, case-by-case litigation to get answers to the questions ignored by the court.

(*Labor continued on page 85*)

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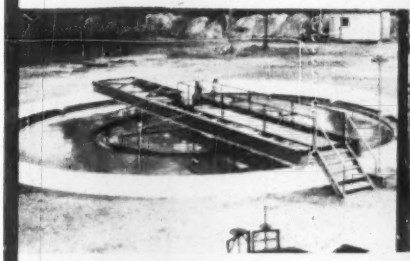

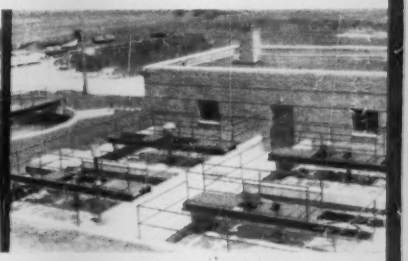

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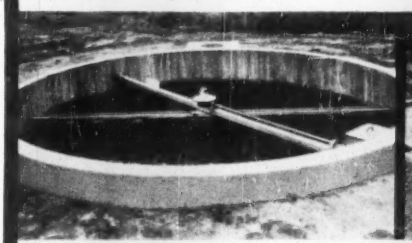

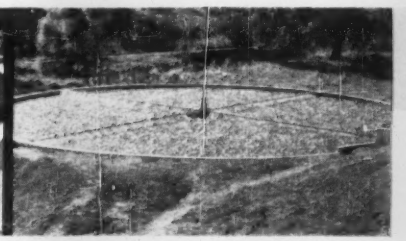

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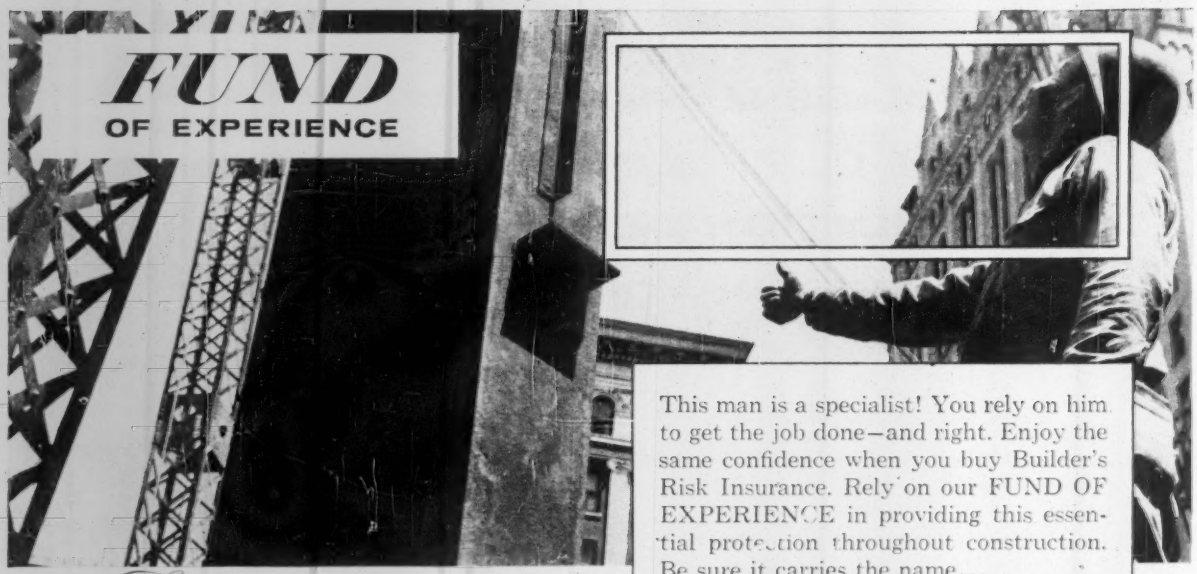

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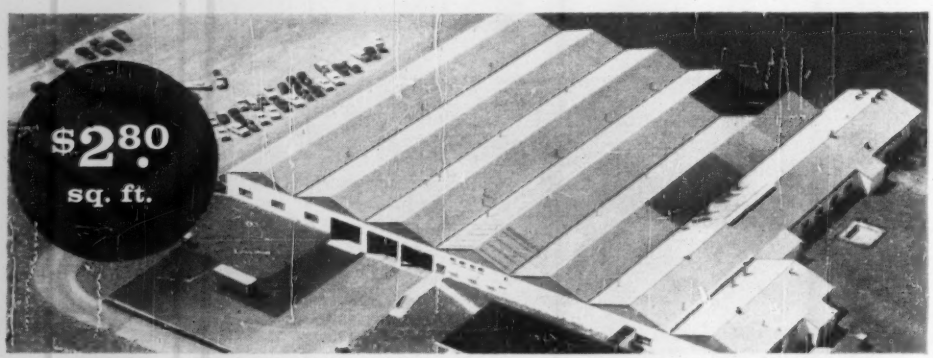

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Ohio Strike Ends

Three-year pact grants Cleveland trades 37 cents

One of the longest construction strikes of the year was settled last week when the building trades unions in Cleveland agreed to a three-year contract calling for a total wage increase of 37 cents an hour.

The work stoppage had lasted for 48 days and had halted more than $350 million worth of home, industrial and commercial building projects in a four-county area.

A major victory won by the contractors in the final settlement was union assurance of full cooperation in a Building Trades Employers' Association program for an increase in productivity and reduction of wasteful work practices on the job.

The settlement provides for a wage increase of 9 cents an hour when the men get back on the job and another 6 cents on January 1, making a total pay boost of 15 cents an hour for the first year. Unions will get 10 cents more an hour next May 1 and an additional 12 cents in May 1960.

Long before the old contracts expired, the BTEA, which has fought to reverse "the inflationary trend of the postwar period," notified the unions that it would not discuss a wage increase "until increased productivity and lowered building costs are assured."

To achieve that goal, the BTEA came up with its own program instead of "Ten Commandments" the AFL-CIO Building and Construction Trades Department had endorsed. The nine-point program calls for:

- Elimination of show-up time because of weather conditions.
- Eight hours' work for eight hours' pay. (This means being at work at 8:00 and not quitting before 4:30.)
- No coffee breaks.
- No restriction on amount of work performed.
- No featherbedding.
- Payment by check at contractor's option.
- Exemption of foremen from labor contracts.
- Performance of work by stewards.
- Elimination of travel time on jobs covered by the agreement.

The Building Trades Council, which negotiated for all unions, had asked initially for a flat 25 cent wage increase. This was dropped to 10 cents at one point and then raised to 18½ cents. During the last few weeks of negotiations, Mayor A. J. Celebrezze served as mediator.

ON ASPHALT—These pictures show the Barco Vibra-Tamp working on asphalt surfacing at an Arizona motel. It moves along, self-propelled, at a uniform rate with minimum effort required of operator.

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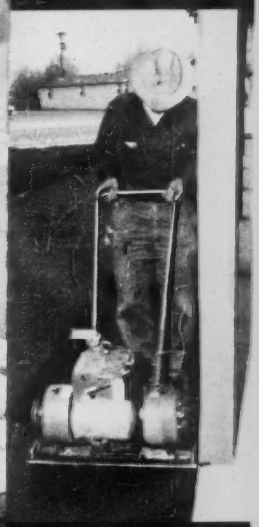

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OFFICIAL PROPOSALS

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New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, Public Buildings Law, and Article 2, Title 5 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A. M., advanced standard time, which is nine-thirty o'clock A. M., eastern standard time, on the 17th day of July 1958, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following Projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, G. L. NICKERSON, District Engineer, 353 Broadway, Albany 1, New York						
Albany & Greene (Rte. 9W)	FARC 58-77	Coxsackie-Ravena Pt. 1 & Pt. 2 S.H. 5198-5370 Ravena Greene County Line, S.H. 5652 Proj. No. DF 365(6)	6.93	Asphalt Concrete	$17,000 Plans $2	$310,000
Greene (Rte. 9W)	FARC 58-75	Catskill-West Coxsackie Pt. 1B & Pt. 2, S.H. 8414-8384 Proj. No. DF 558(7)	9.55	Asphalt Concrete	$17,000 Plans $2	319,000
Saratoga (Rte. 9)	RC 58-69	Various Locations on Saratoga-Glens Falls Pt. 3, S.H. 443	..	Roadside Development	$280 Plans $2	5,000
Schenectady, Warren & Washington (Rtes. 159, 8, 7, 147, 418, 313)	RC 58-83	BR. No. 1 S.H. 163; Br. No. 1 S.H. 880; Br. No. 1 S.H. 1338; Br. No. 1 & Br. No. 2 S.H. 1021; Br. No. 1 S.H. 1023 & Br. No. 1 S.H. 8479.	.....	Cleaning & Painting 7 Bridges	$1,300 Plans $2	23,000
DISTRICT No. 2, LACY KETCHUM, District Engineer, 109 No. Genesee Street, Utica 1, New York						
Oneida	MTC 58-1P	New York State Thruway-Mohawk Section Subd. 9 (Thruway Connection to Utica North-South Arterial)	1-21 (0.62 Acc.)	9" Cem. Conc. Pavt. Var. Wide	$17,000 Plans $2	302,000
DISTRICT No. 3, EARLE E. TOWLSON, Acting District Engineer, 333 E. Washington St., Syracuse, New York						
Cayuga (Rte. 38)	FARC 58-87	Port Byron-Conquest, S.H. 8087 Proj. No. DF 66(2)	0.35	9" Cem. Conc. Pavt. 22' Wi. Comp. I Beam Br. 92'	$14,000 Plans $2	252,000
Onondaga (Rtes. 5, 11, 298, 31, 48, 174, 370 & 57)	RC 58-88	Various Locations on S.H. 3587, S.H. 8025, S.H. 5470, S.H. 672, S.H. 1039, S.H. 5396, S.H. 132, S.H. 5143, S.H. 5080, S.H. 8366, S.H.9083, S.H. 1030, S.H. 670, and S.H. 5274.	.....	Roadside Development	$700 Plans $2 (Prop. Only)	13,000
Onondaga	FIC 58-9 FIRC 58-74	Interstate Route No. 505 (City of Syracuse: Oswego Blvd.); Syracuse Mattydale Fish 54-3 and Phoenix-Syracuse, S.H. 5274 Proj. No. I-1127(4)	2.48 (3.78 Acc.)	Electrical Lighting Facilities	$13,000 Plans $2	226,000
Oswego (Rte. 13)	FARC 58-78	Pulaski-Williamstown Pt. 2, S.H. 972 Proj. No. DF 533(5)	0.67	Asphalt Concrete Ty. 1A	$5,000 Plans $2	91,000
Oswego	FISH 58-26	Interstate Route 505 (Central Square-Parish) Central Square-Constantia, S.H. 1243 C. R. No. 12, 32 and 38. Proj. I-1118(15)	9.01 (4.01 Acc.)	9" Cem. Conc. Pavt. 2 @ 24' Var. Wide = 10.50 Mi. Asph. Conc. Ty. 1A = 1.50 Mi. Bit. Stone Surface Treat. = 1.02 Mi. 4 Hy. Sepa. Comp. I Beams 221', 2841', 250.9' and 226.5' 3 R.C. Closed Box Brs. 24', 26'; and 26'	$340,000 Plans $50 (Full Size)	6,262,000
DISTRICT No. 4, B. F. PERRY, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Monroe (Rte. 33A & 47)	FARC 58-82	Chili Road Pt. 1, S.H. 254; Howard Road, S.H. 9350 Rapids-Rochester, S.H. 401; Proj. No. DF 231(11)	1.19	9" Cem. Conc. Pavt. 2 @ 24' Wide = 0.53 Mi. Asph. Conc. = 0.64 Mi.; Misc. Work = 0.02 Mi. Precast Conc. Beam Bridge 30'	$40,000 Plans $3	748,000
DISTRICT No. 5, E. G. YOUNGMANN, District Engineer, State Office Bldg., 65 Court Street, Buffalo 2, New York						
Cattaraugus (Rtes. 39, 17, 62, 16, 18)	RC 58-89	Various Locations on S.H. 1170, S.H. 730, S.H. 1641, S.H. 1657, S.H. 8160, S.H. 1480, S.H. 960, S.H. 1254, S.H. 5607, S.H. 5608, S.H. 8030, S.H. 5265, S.H. 5259A, S.H. 1269, S.H. 1275, S.H. 1568, S.H. 1569 and S.H. 958.	.....	Roadside Development	$700 Plans $2 (Prop. Only)	12,000
Erie	FINTC 58-3 FAC 58-10	Interstate Route No. 506 (New York State Thruway-Niagara Sect.) City of Buffalo: Kensington Expy. Outlet Drain Proj. No. I-865(17); U 377(14)	4.17	9" Cem. Conc. Pavt. Var. Width = 1.10 Mi. Asph. Conc. Ty. 2B = 2.30 Mi. Outlet Drain = 0.28 Mi. Misc. Work = 0.49 Mi. 6 Ramp Structures 256', 568', 1530', 968', 568', 848' Viaduct Alterations	300,000 Plans $20	5,643,000
Erie (Rte. 20)	FARC 58-73	Southwestern Boulevard, S.H. 9269 Proj. No. DF 1079(6)	4.12	Asphalt Concrete	$48,000 Plans $2	857,000
Erie & Niagara (Rte. 18)	RC 58-84	Br. No. 4 Lawton-Gowanda, S.H. 525B Br. No. 3 Youngstown-Hoyt, Pt. 2, S.H. 8324A	0.11	Cleaning & Painting 2 Bridges	$1,100 Plans $2	26,000
Erie & Niagara (Rtes. 18, 104, 31, 358, 20A)	RC 58-90	Various Locations on S.H. 1734, S.H. 9052, S.H. 617, S.H. 9105, S.H. 1316, S.H. 5417, S.H. 5416, S.H. 5319, S.H. 5431, S.H. 5563, S.H. 1491A, S.H. 1491, S.H. 529, S.H. 5635 and S.H. 86	.....	Roadside Development	$1,000 Plans $2 (Prop. Only)	18,000
DISTRICT No. 6, J. H. THOMAS, District Engineer, State Office Bldg., 30 West Main Street, Hornell, New York						
Chemung	FASS 58-4	Breesport C.R. No. 1 Proj. S 4(2)	0.15	Bit. Mac. Ty. 1 Prestressed Conc. Beam Br. 61.3'	$6,000 Plans $10 (Full Size)	111,000
Chemung & Tioga (Rte. 34)	FARC 58-91	Waverly-Lockwood, S.H. 1078, Lockwood-Van Etten Pts. 1 & 2 S.H. 8224 Proj. DF 995(3); DF-102(3)	7.24	Asph. Conc. Comp. I Beam Br. 169.5', Prestressed Conc. Br. 44', Repairs to Two Existing Brs.	110,000 Plans $5	2,107,000
Steuben (Rte. 15)	FARC 58-79	Bath-Avoca S.H. 5204 Proj. DF-225(12); DF-627(11)	2.28	Asph. Conc. Incl. Repairs to Two Existing Brs.	$20,000 Plans $2	367,000
Schuyler & Steuben (Rte. 226)	FARC 58-76	Savona-Bradford, S.H. 1102 Bradford-Tyrone, S.H. 1420 Proj. S-775(2)	8.79	Asph. Conc. = 0.59 Bit. Mac. Ty. 1 = 8.20 Mi. Comp. I-Beam Br. 45' Widen. Exist. R.C. Slab Bridge 24'	$75,000 Plans $10	1,375,000
DISTRICT No. 7, R. W. SWEET, District Engineer, 444 Van Duzee Street, Watertown, New York						
Jefferson (Rte. 12E)	FARC 58-71	Cape Vincent-Watertown Pt. 2, S.H. 1164 Proj. DF-565(4)	4.62	Asph. Conc. Ty. 1A = 4.56 Mi. Misc. Work = 0.06 Mile	$43,000 Plans $3	780,000
St. Lawrence (Rte. 37C)	FARC 58-72	Massena-Helena Pt. 2, S.H. 1265 Proj. DS-367(3)	2.40	Asph. Conc. Ty. 1A	$19,000 Plans $3	340,000
St. Lawrence (Rte. 11 & 87)	PSC 8143	Elimination of Grade Crossing of the New York Central Railroad with Richville-DeKalb Junction Pts. 1 & 2 S.H. 8476-9236 (Bairds Crossing)	0.72 (0.17 Acc.)	Asph. Conc. Ty. 1A Hy.-RR Sep. Comp. I-Beam 251'.	$34,000 Plans $3	629,000
St. Lawrence (Rte. 68)	FARC 58-85	Canton-Pierrepont, S.H. 1126 Proj. No. DS-435(1)	1.10	Bit. Mac. Double Surf. Treat. = 1.00 Misc. Work = 0.10 2 R.C. Slab Bridges 30' and 30' 1 I-Beam Bridge 48.2'	$29,000 Plans $3	523,000
DISTRICT No. 8, K. G. RAUER, District Engineer, Pleasant Valley Road, Poughkeepsie, New York						
Columbia (Rte. 23)	FARC 58-81	Hollowville-Craryville, S.H. 763; Craryville-State Line, S.H. 762 Proj. No. DF-564(7)	4.34	Asph. Concrete 4 R.C. Closed Box Brs. 25.1', 47.4'; 38.2' and 21'	$40,000 Plans $3	685,000
Dutchess (Rte. 44)	FARC 58-49	Pleasant Valley-Washington Hollow, S.H. 748 Washington Hollow-Millbrook, S.H. 609 Proj. DF-633(3)	3.70	Asph. Concrete	$22,000 Plans $2	398,000
Putnam (Rte. 6)	FARC 58-80	Brewster-Carmel, S.H. 909 Proj. DF-590(4)	0.56	9" Cem. Conc. Pavt. 24' Wide Repairs to Exist R. R. Gr. Sep. Struct.	$11,000 Plans $2	200,000
DISTRICT No. 9, J. C. FREDERICK, District Engineer, 71 Frederick Street, Binghamton, New York						
Delaware (Rte. 30)	FARC 58-86	Margaretville-Halcottsville, S.H. 5384 Proj. No. DS-459(2)	0.46	Asph. Conc. Ty. 1A Comp. I-Beam Br. 84'	$14,000 Plans $15 (Full Size)	234,000
DISTRICT No. 10, M. E. GOLL, District Engineer, 325 W. Main Street, Babylon, L. I., New York						
Nassau	FAC 58-11	Glen Cove Arterial, Cont. 2 (Long Island Railroad to Pratt Boulevard) Proj. No. U-1102(2)	0.59	9" Cem. Conc. Pavt. 2 @ 25' Wide = 0.53 mile Misc. Work = 0.06 mile Hy. Sep. Weld. Plate Girder 175'	$74,000 Plans $5	1,341,000
Queens	FICE 58-1	Int. Rte. Conn. 513 Clearview Expressway (Cont. 1D) Proj. No. I-1112(6)	3.05	Demolition of Buildings	$15,000 Plans $2	266,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

OFFICIAL PROPOSALS

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.
The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.
Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.
Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".
The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: June 30, 1958.

Central Electrica De Furnas S. A. Notice to Hydraulic Turbine Manufacturers

Applications for pre-qualification of bidders for the manufacture and delivery of hydraulic turbines will be received at the main office of Central Electrica de Furnas S.A. (FURNAS) in Rio de Janeiro, Brazil, Rua Sao Jose 90—3° andar, not later than 12:00 AM of June 30, 1958.
Tenders will cover the first stage (3 to 5 units totalling 600,000 HP) of the Furnas hydro-electric development on the Grande River, near the town of Passos, State of Minas Gerais, Brazil.
Initial installation shall provide for operation of the first unit early in 1962 and of subsequent units at about 3 months' intervals.
The Furnas development will have an ultimate installed capacity of 1,500,000 HP, with 8 to 12 units rated as above.
Applicants for pre-qualification must submit adequate information on the following items:
1. Manufacturing experience on large turbines.
2. Orders in hand and scheduled deliveries up to 1962.
3. Research, design and testing facilities.
4. Available shop space and facilities, including size limitations of main machine tools.
FURNAS will only consider tenders submitted by the manufacturers selected among applicants at its sole discretion and judgement. Negotiations with FURNAS shall be held directly by the manufacturers' head office or through branch offices or subsidiaries in Brazil. FURNAS will not deal with intermediaries or agents.
Invitations for tender shall be issued in July/August, 1958 for submittal of same by November 1958. Placing of order with the successful bidder is scheduled for about January 1959.

Prequalification Date: July 1, 1958

BOARD OF EDUCATION
BUREAU OF CONSTRUCTION
Notice Re: Prequalification Forms of Contractors

NOTICE IS HEREBY GIVEN THAT The Superintendent of School Buildings, Bureau of Construction, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City 1, N. Y. will receive applications for prequalification from contractors who may wish to submit bids for the proposed hereinafter specified contracts as follows:
General Construction, Plumbing and Drainage, Heating and Ventilating, Electrical Work and Lighting Fixtures for the new Public School 132, The Bronx, East 168th Street between Washington and Park Avenues.
Prequalification application forms will have to be secured from and must be submitted to the Superintendent of School Buildings, Bureau of Construction, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City 1, N. Y.
Bids when advertised, will be received from prequalified bidders only.
Time for submitting prequalification application by contractors will expire on Tuesday, July 1st, 1958.

City Record—Saturday, June 21, 1958
WILLIAM H. CORREALE
Superintendent of School Buildings,
Design and Construction
Dated: June 18, 1958

Bids: July 17, 1958.

Erie Canal, Contract M58-8

NOTICE TO CONTRACTORS
STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Canal Law and Highway Law, sealed proposals will be received, until 10:30 A.M. DST on July 17, 1958, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, the Governor Alfred E. Smith State Office Building, Albany, N. Y. for:
Contract M 58-8 for Cleaning and Painting Guard Gates over the Erie Canal in Herkimer and Oneida Counties, New York; Engineer's Estimate for M 58-8 is $42,-000.00
Maps, plans and specifications may be examined and obtained at the following offices:
(a) Bureau of Contracts, 14th Floor, The Gov. Alfred E. Smith State Office Bldg., Albany, New York.
(b) Department of Public Works, 270 Broadway, New York City, N. Y.
(c) In addition to the above mentioned offices, plans, maps, and specifications for Contract M 58-8 may be examined and obtained at the office of Mr. Lacy Ketchum, District Engineer, 109 No. Genesee Street, Utica, New York.
The deposit for Plans and Proposal Forms for Contract M 58-8 is $10.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.
Proposals for M 58-8 must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" in the amount of $2,-200.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Canal Law and the Highway Law as set forth in "Instructions to Bidders in the contract specifications.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: July 10, 1958.

Benjamin Franklin Bridge Contract No. 2-A-B

DELAWARE RIVER PORT AUTHORITY
of the
COMMONWEALTH OF PENNSYLVANIA
and the
STATE OF NEW JERSEY
Administration Building
Camden, New Jersey

Sealed bids will be received for repairs to the creosoted fender system at the Philadelphia tower pier of the Benjamin Franklin Bridge, known as Contract No. 2-A-B, at the office of the Executive Director of the Delaware River Port Authority, Administration Building, Benjamin Franklin Bridge Plaza, Camden, New Jersey, until 2:30 P.M., Eastern Daylight Saving Time, Thursday, July 10, 1958, at which place and time they will be publicly opened and read by the Authority.
A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this contract, which may be obtained upon deposit of a $10.00 check, which will be remitted upon receipt of bid or the return in good condition of the copies so taken, within thirty days after the opening of bids.
Each proposal must be accompanied by a certified check in the sum of $2,000 payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company having an office or place of business either in Philadelphia, Pennsylvania or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a Performance and Labor and Materialman's Bond in the sum of 100 percent.
The Authority will afford prospective bidders an opportunity to inspect the site of the Work.
The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.
DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLO
EXECUTIVE DIRECTOR

Bids: July 21, 1958

Advertisement For Milk River Drain Pumping Station Wayne County, Michigan

Sealed proposals for furnishing all labor, material and equipment for constructing the Milk River Drain Pumping Station (capacity 2350 C.F.S.) consisting of two parts: A—100 ft. diameter Caisson and Inlet Structure; B—Superstructure, will be received by the Drainage Board for the Milk River Drain, Wayne County, Michigan, at the Board Room of the Wayne County Auditors, Room 1236, City-County Building, Detroit, Michigan, at or before 11:00 o'clock A.M. Eastern Standard Time, Monday, July 21, 1958, at which time the bids will be publicly opened and read. No bid may be withdrawn after scheduled closing time for at least 40 calendar days.
Contract documents and plans may be examined at the office of Henry V. Herrick, Drain Commissioner for Wayne County, Secretary of the Drainage Board, 3523 Cadillac Tower, Detroit, Michigan. Contract documents and plans may be examined and procured at the office of the Consulting Engineers, 532 Michigan Building, Detroit, Michigan. A deposit of $25.00 will be required for contract documents and plans necessary for bidding. The entire deposit will be refunded only upon return of documents and plans in good condition within twenty days after date bids are received. An additional deposit of $5.00 will be required for mailing, no refund. Bids may be rejected unless made on forms furnished with the contract documents.
A certified check or bid bond in the amount of 5% of the bid made payable to the Drainage Board for the Milk River Drain must accompany each proposal. The deposit of the successful bidder shall be forfeited if he fails to execute the contract and bonds within ten days after the award.
The Drainage Board reserves the right to reject any or all bids, waive informalities or accept any bid it may deem best.
Contract documents and plans will be ready for bidders Wednesday, P.M. June 25, 1958.

Drainage Board for the Milk River Drain
Henry V. Herrick
Wayne County Drain Commission,
Secretary
Pate and Hirn,
Consulting Engineers
532 Michigan Building
Detroit, Michigan

U. S. Government

D. C. GOVT., DEPT. OF BLDGS. & GROUNDS, D. C., June 13, 1958. SEALED PROPOSALS will be received in Room 404, 499 Pa. Ave. N.W., Wash., D. C., until 2 PM, EDT, July 24, 1958, and then publicly opened and read for construction of Youth Correctional Center Buildings, Underground Utilities and Site Work, near Lorton, Virginia. Proposal forms, plans and specifications obtainable from Supervisor, Bid & Contract Section, Procurement Office, D. C., Rm. 404, 499 Pa. Ave. N.W., upon deposit of a certified check for $200.00 per set, payable to D. C. Treasurer. (phone NA 8-6000, Ext. 2378).

READ THE OFFICIAL PROPOSAL COLUMN OF
ENGINEERING NEWS-RECORD
THIS WEEK AND EVERY WEEK

OFFICIAL PROPOSALS

Bids: July 22, 1958

CONTRACT GWB-190.003

THE PORT OF NEW YORK AUTHORITY
GEORGE WASHINGTON BRIDGE
LOWER LEVEL EXPANSION
NEW YORK APPROACH SECTION NO. 1

Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals for the construction of an approach roadway system in New York for the lower level expansion of the George Washington Bridge will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1140, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, July 22, 1958, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $50.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $50.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, June 19, 1958

Bids: July 10th, 1958

Administration Building Area Poughkeepsie, N. Y.

NOTICE TO BIDDERS

Poughkeepsie, New York

Sealed proposals will be received by the New York State Bridge Authority at its office at Mid-Hudson Bridge Plaza, Poughkeepsie, until 2:00 P.M. Eastern Daylight Saving Time on the 10th day of July 1958, at which time and place they will be publicly opened and read, for the furnishing of the labor and material necessary for the developing of the Administration Building Area at the easterly approach to the Mid-Hudson Bridge at Poughkeepsie, New York. Plans, specifications, proposal blanks, form of contract, bond and information for bidders may be seen at the office of the New York State Bridge Authority, Mid-Hudson Bridge Plaza, Poughkeepsie, New York, and copies of the same may be obtained therefrom upon a deposit of Fifteen Dollars ($15.00), which sum will be refunded if the plans and specifications are returned by bidders in good condition within twenty (20) days of bids having been received and acted upon by the New York State Bridge Authority, and Ten Dollars ($10.00) will be so returned to non-bidders.

A certified check on a National Bank, State Bank or Trust Company in the sum of ten per cent (10%) of the amount of the bid, made payable to the New York State Bridge Authority must accompany the bid, as a guarantee that the contract will be entered into, if awarded.

A faithful performance bond in the sum of one hundred per cent (100%) of the contract price will be required.

A Labor and material bond will also be required.

The New York State Bridge Authority reserves the right to reject any or all bids.

JOHN S. STILLMAN
Chairman

Bids: July 17, 1958

New York State Contract M58-11

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Canal Law and Highway Law, sealed proposals will be received, until 10:30 A.M. DST on July 17, 1958 by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, the Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

Contract M 58-11 for Cleaning and Painting Three Canal Bridges in Monroe County and the Medina Guard Gate, Orleans County, N. Y.
Engineer's Estimate for M 58-11 is $12,-300.00.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, The Gov. Alfred E. Smith State Office Bldg., Albany, New York.
(b) Department of Public Works, 270 Broadway, New York City, N. Y.
(c) In addition to the above mentioned offices, plans, maps and specifications for Contract M 58-11 may be examined and obtained at the office of Mr. B. F. Perry, District Engineer, Barge Canal Terminal, Rochester, New York.

The deposit for Plans and Proposal Forms for Contract M 58-11 is $10.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Proposals for M 58-11 must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" in the amount of $700.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Canal Law and the Highway Law as set forth in "Instructions to Bidders" in the contract specifications.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: July 14, 1958

Advertisement For Bids

The City of East Moline, Illinois, will receive sealed bids for Sewage Treatment Plant and Intercepting Sewer System until 7:00 P. M. (Central Standard Time) on the 14th day of July, 1958, at the office of the City Clerk of the City of East Moline, Illinois.

All bids received will be publicly opened and read aloud in the Council Chamber of the City Hall, East Moline, at 7:30 P. M. of the same date.

The successful bidders will be required to furnish a satisfactory performance bond.

The contract documents, including plans and specifications are on file at the office of the City Clerk of the City of East Moline, Illinois, and at the office of Interstate Engineering, Consulting Engineers, 601-26th Avenue, Rock Island, Illinois.

Copies of plans and specifications may be obtained by depositing $35.00 with Interstate Engineering for each set of Sewage Disposal Plant plans and specifications and for each set of Intercepting Sewer plans and specifications. The amount of the deposit will not be refunded.

The City of East Moline reserves the right to reject any or all bids and to waive any informalities in bidding.

A certified check or bank draft, government bonds, or cash, payable to the City of East Moline, Illinois, or a satisfactory bid bond executed by the bidder and a surety company in an amount of not less than 5% of the bid, shall be submitted with each bid.

No bid may be withdrawn after the scheduled closing time for receipt of bids for at least thirty (30) days, without the consent of the City of East Moline, Illinois.

CITY OF EAST MOLINE, ILLINOIS.
By Frank Eposito
Mayor

Attested By:
Arnold Neihaus
City Clerk

Date: June 16, 1958.

Bids: July 15, 1958

Power Authority of the State of New York

ADVERTISEMENT FOR PROPOSALS
For the Furnishing and Delivery of Unit Control Boards For
Lewiston Power Plant
Niagara Power Project
Specifications No. PA-N-25023
Niagara Contract No. NP18

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the furnishing and delivery thereof f.o.b. Lewiston Power Plant Area, University Siding, Niagara Falls, New York, of unit control boards for the Lewiston Power Plant in Lewiston, Niagara County, New York5 until 10:30 A.M., Eastern Daylight Saving Time on the 15th day of July, 1958, at the Authority's Office, 18th floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place proposals will be publicly opened and read aloud.

Bids will be received for thirteen (13) unit control boards and associated equipment in accordance with the bidding schedule.

Delivery of the unit control boards will be required beginning on or before May 1, 1960.

Plans, Specifications and Proposal Forms for the work may be obtained from the Power Authority of the State of New York, 18th floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of Ten Dollars ($10.00) per initial set of contract documents and Five Dollars ($5.00) per set for additional sets, no part of which will be refunded. Plans, Specifications and Proposal Forms for the work will be on file in the Authority's Office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and may be inspected by prospective bidders during office hours.

Bids must be made and returned in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than twenty (20) percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. Chaplin
General Manager

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5069) will be received at Linwood, Utah until July 25, 1958, for furnishing labor and materials for constructing an Administration Building, Garage and Fire Station, and Laboratory Building for Flaming Gorge Community Facilities, Colorado River Storage Project, Location in Daggett County, Utah. Principal items are constructing administration building (approximately 36 x 12 feet); constructing garage and fire station (approximately 31 x 75 feet); constructing laboratory building (approximately 39 x 54 feet); buildings to be complete with plumbing, heating and electrical systems, surfaced walks and driveways; and other work. Completion time 350 days. For particulars, address Bureau of Reclamation, Linwood, Utah; P. O. Box 360, Salt Lake City, Utah; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

Department of Commerce, Civil Aeronautics Administration. Sealed bids (Invitation No. 9-3034-B1) will be received at Washington, D. C., until 2:00 P. M., July 15, 1958, for clearing, grubbing and demolition in preparation for development of the Washington International Airport in Fairfax and Loudoun Counties, Virginia; approximately 3,900 acres to be fully cleared, including approximately 1,275 wooded acres, within 90 days after Notice to Proceed; partial clearance of approximately 4,300 acres within 150 days after Notice to Proceed; includes removal of approximately 350 buildings, including dwellings, barns, silos, all fences and other types of structures, installations and improvements. For particulars, address Procurement Division, W-160, Civil Aeronautics Administration, T-5 Building, Room 2615, Washington 25, D. C.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5068) will be received at Ephrata, Washington until July 29, 1958, for furnishing labor and materials for Potholes East Canal Enlargement, Station 172+00 to Station 251+00, and Station 510+00 to Station 770+00, Columbia Basin Project, Washington. Location near Othello, Washington. Principal items are 1,811,000 cu. yds. excavation; 170,000 cu. yds. earth lining; 120 cu. yds. concrete in structures; 38 MbM timber in structures; and other work. Completion time part 135 days and part 500 days. For particulars, address Bureau of Reclamation, P.O. Box 368, Ephrata, Washington; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

EMPLOYMENT OPPORTUNITIES

NATIONAL COVERAGE

Send NEW Ads and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36.
July 10th issue closes June 27th

DISPLAYED RATE:
The advertising rate is $39.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.
An advertising inch is measured 7/8" vertically on a column—3 columns—30 inches to a page.
Subject to Agency Commission.

UNDISPLAYED RATE:
$2.40 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.
Position Wanted ads take ½ of above rate.
Box Numbers—count as 1 line.
Discount of 10% if full payment is made in advance for 4 consecutive insertions.
Not subject to Agency Commission.

ADDRESS BOX NO. REPLIES TO: Box No., Classified Adv. Div. of this publication, Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

• POSITIONS VACANT

Highway Engineers—Highway Engineers with a minimum of 3 years experience. Excellent opportunity with established consulting engineering firm in Middle West. P-7909, Engineering News-Record.

Have opening for several recent Civil Engineer Graduates with military obligations completed who desire to learn the construction business. Must be ambitious, aggressive, use no intoxicants, preferably single, willing to start in the field on industrial buildings and heavy construction, and willing to move. We operate throughout Kansas and adjacent states. Our organization offers excellent opportunity for advancement. We pay top wages. Martin K. Eby Constr. Co., Inc., P.O. Box 1679, Wichita, Kansas.

Technical Service Engineer. Civil Engineer for technical field work with customers of major cement producer. Age 24-30. Salary open, expenses, company car. Forward resume. P-8112, Engineering News-Record.

Responsible operator builder with many years of field construction experience desires to meet a man experienced in estimating and procurement with some contacts. Salary and participation. Must be able to prove ability. State age, formal education, kind of construction work familiar with, salary expected, percentage of participation desired, and telephone number. Information will be held in strict confidence. P-8190, Engineering News-Record.

Established building construction firm, home office in Metropolitan Boston, operating throughout New England, desires an experienced general manager to serve as administrative assistant to operating head of firm. Reply P-8232 Engineering News-Record.

Wanted Assistant City Engineer. Please send complete resume including salary desired in first letter. Apply to Director of Public Works, New London, Connecticut.

Three instructors in civil engineering are needed. Salary (B. S. Degree) $4200 for nine months. Allowed to register for one graduate course. May take more graduate work by teaching ¾ time. May do research, teach, or practice during the summer. Apply direct to Department of Civil Engineering, Mississippi State University, State College, Mississippi.

Assistant City Engineer—City of Lockport, New York, invites applications. Must be graduate Civil Engineer, a Professional Engineer, or one who will be qualified to take examination. Salary commensurate with experience and ability, opportunity for increase in salary and advancement, fringe benefits. Contact Commissioner of Public Works, City Hall, Lockport, New York.

Concrete Superintendent, sober, capable of building highway and railroad culverts, spillways, small dam structures. Location, Midwest, with established contractor. Please furnish complete qualification resume. P-8240, Engineering News-Record.

Bridge Superintendent, experienced in building highway and railroad bridges. Location, Midwest. Salary open as to qualifications. Give full details covering experience, references and personal data. P-8241, Engineering News-Record.

Construction Executive. Nationally known construction company seeks topnotch young executives. Opportunities for management of entire division of construction company. Prefers some experience in business management. Individual must be capable of estimating and supervising in fields of highway, heavy and tunnel construction. However, not necessary that his present responsibilities be commensurate with responsibilities of position offered. Ability and youth will be given significant consideration. Both foreign and domestic work. Salary open. Please submit complete personal information and resume of experience. All replies will be held confidential. P-8238, Engineering News-Record.

M.S. in Structures—Permanent position for qualified engineer to handle indeterminate structures for buildings. Excellent living conditions, good future possibility for a well qualified person. Location—N. C. P-8226, Engineering News-Record.

• POSITIONS VACANT

Structural Engineer—Young civil engineer with a minimum of 3 years experience in reinforced concrete and structural steel bridge design. Permanent position with established consulting engineering firm. Location, mid-south. Complete education and experience data and recent photo should be furnished in first reply. P-8262, Engineering News-Record.

Civil Engineers—Young civil engineers for expressway design. Permanent positions with established consulting engineering firm. Location, mid-south. Complete education and experience data and recent photo should be furnished in first reply. P-8270, Engineering News-Record.

Wanted: Engineer for Highway Survey and Plans Work on County F.A.S. and Township M.F.T. Projects. Degree or similar experience required. Please give education, experience and salary required. Reply to—Adams County Superintendent of Highways, 3535 Broadway, Quincy, Illinois.

Bridge Design Engineer for responsible position in N.Y.C. Consultant's office. Send resume to P-8282, Engineering News-Record.

Engineer-Experienced in Layout & Design of Water & Sewerage—Chief of Party experienced in Land Surveying of Municipal subdivisions, sewer and water layout. Salary Open. Eastern New York State. P-8292, Engineering News-Record.

County Engineer Wanted: Require registered engineer with highway experience. For more information contact Guthrie County Board of Supervisors, Guthrie Center, Iowa.

Contractor's Engineer, with several years field experience with general contractor on building construction, for well established, dynamic, growing general contractor. College graduate preferred. Above average opportunity for advancement in young-minded organization. This man will be located permanently at our Home Office. Please send resume and identification photo. P-8322, Engineering News-Record.

• POSITIONS WANTED

Construction Superintendent. General Construction. Twenty-five years experience. References. PW-8169, Engineering News-Record.

Architect-Engineer's manager 22 yrs. exp. handling business getting, contracts, field supervision, closing, age 45 six yrs. with present employer, desire change. PW-8120, Engineering News-Record.

Eng. non-grad., 28, 8 yrs, exp. bus. administration, constr. eng. office & field, estimating, struct. design, $170 min. anywhere. PW-8218, Engineering News-Record.

Project Manager—P.E. 43, Experienced consulting and construction—bridges, highways, dredging and administration of consultant's office. Speaks Spanish. Desires foreign work with consultant. PW-8237, Engineering News-Record.

Civil-Sanitary Engineer-35-BSCE-MSSE-PE-Spanish descent, now employed, desires to represent Firm or Firms manufacturing Sanitary Engineering equipment which desire sales and/or engineering consultant services for their equipment in the Caribbean and/or Latin America. PW-8243, Engineering News-Record.

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(Continued on the following page)

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Plus car and expenses. With profit sharing your earnings should be a minimum of $25,000 yearly. For interview, please submit brief resume. Write:

P-8198, Engineering News-Record
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P-8259, Engineering News-Record
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P-8252, Engineering News-Record, Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

• POSITIONS WANTED
(Continued from preceding page)

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Civil Engineer B.S. in C.E., 28, married, licensed P.E. in Mass. 6 years experience:—Field Supervision Foundation contracts, general construction administration and sales, some estimating and design. Desires position with Future. Location Boston or vicinity. PW-8319, Engineering News-Record.

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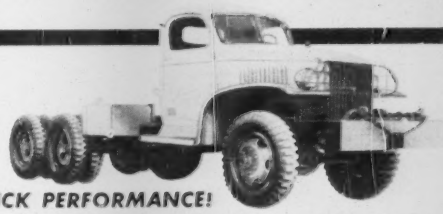

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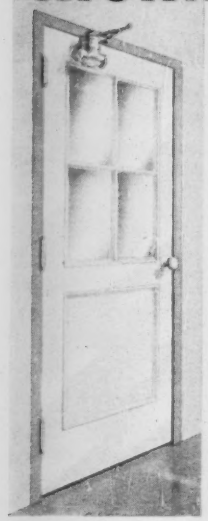

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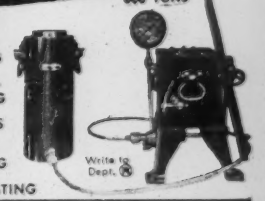

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On Construction's Stature

CAN YOU IMAGINE the President of the United States calling his Cabinet to special session annually to hear spokesmen of the construction industry present a brief supporting legislative proposals? Of course, to conceive of such a situation requires first that you imagine an organization that could act as spokesman for the entire U. S. construction industry. And while about it, you might as well imagine, too, that a Secretary of Public Works sits among the President's Cabinet members at this audience for our industry.

Impossible? It does seem somewhat idealistic to consider the construction industry's chosen spokesmen conferring with our head of state on important matters of common concern. Yet, there are so many important matters of common concern. And at present there is no single group of construction leaders in a position to be heard as to their thoughts on these matters. Several organizations speaking for separate segments of the construction industry are heard occasionally amid the din and discord of other such voices constantly raised for a hearing in the nation's capital.

Construction as an industry, lacks a complete and proper concept of its size and its essential unity (ENR Apr. 17, p. 196). This big, basic industry represents roughly a seventh of all business activity of the country. How much better it might conduct its relations with other segments of the economy, as well as with legislative and executive branches of the government, if the single industry concept—and a single strong voice—were to prevail.

If this dream situation of a single voice for construction were to prevail, perhaps the President of the United States could be brought to devote his time and his Cabinet's time to hearing and discussing policy statements of the industry. Perhaps the established, agreed upon views of designers, constructors, materials suppliers —all elements of the industry—would carry real weight in Washington.

Does it still sound impossible?

Last month in Canada (where construction accounts for one-fifth of the national economy) an executive group of the Canadian Construction Association, a broad-gage industry group, of which the U. S. has no counterpart, met with Prime Minister John G. Diefenbaker and 11 members of his Cabinet. This audience in Ottawa followed the 40th annual meeting of CCA, and the CCA officers presented a brief based on the policy statement and resolutions adopted by their industry group—called Canada's Construction Parliament—at its January meeting (ENR Feb. 6, p. 23). Their brief this year considered need for low-cost housing; it promoted the idea of a Dominion-Provincial Highway Organization, citing the U. S. federal-aid highway program as its example; it entered a lengthy plea for proper procedures in general contracting, along with a code of practice to govern bidding procedures between prime contractors and their subcontractors; it recommended on labor relations and labor contracts; it argued against certain taxes on building materials.

This year's was not the first such official audience CCA has had with the Prime Minister of Canada and members of his Cabinet. The first one followed CCA's organization in 1918, and the industry-government conference has been an annual affair since 1954. Over the years a number of CCA suggestions have been adopted, have become legislation.

U. S. construction can often find good examples set by its Canadian counterpart. The top-level attention to construction as an industry in Canada is a prime case in point—an ideal not entirely impossible of achievement here.

Pioneering Tunnelers

EFFORTS OF THE TWO JOINT VENTURES mining the 44 mile West Delaware Tunnel to develop the burn hole procedure (p. 28) deserve the careful appraisal of all hard rock tunnelers. For, in the results obtained, there exists good evidence that the method of drilling large unloaded holes can produce an over-all speedup in tunneling, by eliminating angle drilling of blast holes to form the conventional "pyramid." This speedup was more than a little responsible for the world tunneling record of 83 ft daily advance claimed by one of the West Delaware contractors.

Success in burncutting hinges on the performance of the large drills needed to produce the cores. Since it is practical to mount only one of these on a jumbo, the large drill cannot be subject to frequent breakdowns which then stop the entire job.

It is perhaps fortunate for appraisal purposes that the two contractors on this New York City Board of Water Supply job chose two different approaches to achieve the same result. The Drake-Grafe-Winston-Tecon-Conduit group used a king-size drifter mounted on a hydraulic boom to drill two 5 in. dia burn holes. MacLean-Grove-Brewster used a single burncut, and so could fix its 8 in. converted "down the hole" drill to the jumbo carriage. Both drills are percussion type.

It should be noted that a third equipment setup for burncutting recently proved successful in a 16 ft dia tunnel along the Chicago waterfront. Here a huge 14 in. rotary drill was employed by Grafe-Tecon-Mittry-Drake. But the Chicago and New York jobs are not quite comparable since the silica-short limestone being drilled in Chicago is much less abrasive than is Catskill sandstone and shale.

In any event, all of these pioneering contractors, and the manufacturers who developed the critical equipment, are to be commended for advancing the tunneling art.

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Below: Route 5, approximately 5 miles east of Erie. Pennsylvania State Highway Department. Contractor: Geo. S. Mellert-Weidner Co.

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